Health and Safety Plan for
Non-Time Critical Removal Support
Gulfco Marine Maintenance Superfund Site
Freeport, Brazoria County, Texas
EPA Identification No. TXD055144539

EPA Region 6 Remedial Action Contract 2
Contract: EP-W-06-004
Task Order: 0067-NSEE-06JZ

Prepared for

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November 2010
Revision: 00
EA Project No. 14342.67

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11/24/10

Tim Startz, PMP — Date
EA Program Manager

11/24/10

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11/24/10

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1. INTRODUCTION

On 19 November 2010, the U.S. Environmental Protection Agency (EPA) issued Task Order 0067 under Remedial Action Contract No. EP-W-06-004 to EA Engineering, Science, and Technology, Inc (EA). Under this Task Order, EA is authorized to conduct Non-Time Critical Support (NTCRS) activities at the Gulfco Marine Maintenance (Gulfco) Superfund site (EPA Identification No. TXD055144539) located in Freeport, Brazoria County, Texas. The NTCRS includes preparation of project plans, field work that will include the collection of additional samples of the Site's existing impoundment cap and wetlands sediment material, laboratory analyses of these samples, evaluation of existing site data applicable to the Task Order Statement of Work (SOW), completion of a streamlined ecological risk evaluation and Engineering Evaluation and Cost Analysis (EE/CA) for repair of the impoundment cap and possible hot spot wetlands sediment removal, and community relations functions throughout the EE/CA and decision making process. This site-specific Health and Safety Plan (HSP) was developed to address health and safety concerns associated with the oversight of field investigation activities.

1.1 PURPOSE

The purpose of this HSP is to provide personnel with protection standards and mandatory safety practices, procedures, and contingencies to be followed while performing field activities at the site. This HSP, as developed, defines actions to be taken in respect to personal safety during work activities associated with the field activities to be performed as part of this Task Order, and described further in this HSP.

EA considers the health and safety of its employees, clients, and visitors and the prevention of work-related accidents and illness and property loss to be of the highest priority. Proactively implemented, a comprehensive and systematic health and safety program will result in more efficient and profitable operations by improving employee health and morale, and by reducing worker's compensation costs, lost time, fire and liability insurance premiums, and property damage. The objectives of EA's Health and Safety Program are to ensure:

- Sound health and safety practices and conditions necessary for the protection of the health and welfare of employees, clients, and visitors
- Compliance with federal and state health and safety regulations and standards
- Effective safety and fire prevention practices necessary for protection of company-owned or operated property.

This HSP addresses the following regulations and guidance documents:

- National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR 300.150

- Occupational Safety and Health Administration (OSHA) Standards for General Industry, 29 CFR 1910

- National Institute of Occupational Safety and Health, OSHA, U.S. Environmental Protection Agency, and U.S. Coast Guard *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities,* October 1985.

One copy of this HSP will be maintained for use during the entire duration of field activities and made available for site use/employee review at all times.

EA personnel who enter the site are required to read and understand this HSP and sign the site HSP Review Record (Appendix A).

1.2 BACKGROUND

This section provides a description of the site, lists the Scope of Work (as determined by EPA), and provides a list of potential constituents of concern for the site.

1.2.1 Site Description

The Gulfco site is located at 906 Marlin Avenue approximately 3 mi northeast of Freeport, Texas, Brazoria County; the site coordinates are 28°58'07" north latitude and 95°17'23" west longitude (Figures 1 and 2). The Gulfco site consists of approximately 40 acres within the 100-year coastal floodplain along the north bank of the Intracoastal Waterway between Oyster Creek to the east and the Old Brazos River Channel to the west. Marlin Avenue divides the site into two primary areas (Figures 1 and 2). The area south of Marlin Avenue drains toward the south where it enters into the Intracoastal Waterway. Drainage from the site north of Marlin Avenue is to the northeast into adjacent wetlands. The wetlands are classified as estuarine, intertidal, emergent, persistent, and irregularly flooded.

The property to the north of Marlin Avenue (the North Area) contains three closed surface impoundments and a former product storage tank area. The property south of Marlin Avenue (the South Area) contains two barge slips connected to the Intracoastal Waterway and an aboveground storage tank farm area within a concrete berm. However, there was no berm present around the aboveground storage tank area during a 1989 inspection. The property located north, west, and east of the North Area is unused and undeveloped. Adjacent property to the east of the South Area is developed and currently used for industrial purposes, while to the west, the South Area is currently vacant and previously served as a commercial marina. A residential community and marina are located west of the former marina.

The Gulfco site operated between 1971 and approximately 1998, after which time bankruptcy was filed. The primary site operations consisted of draining, cleaning, servicing, and repairing chemical barges. The barge repair work included welding, sandblasting, and painting. Beginning in 1971, wastes from the barges were placed in the former surface impoundments, which were earthen pits located on Lot 56 in the North Area. The wastes included oils, caustics,

various organic chemicals, and waste washwaters generated during barge cleaning activities. Several inspections during the 1970s reported overflow releases from the impoundments. The volume of waste materials placed in the impoundments is unknown. The impoundments were deactivated in October 1981 and closed in 1982. Impoundment closure included removal of liquids and most of the impoundment sludge. A portion of the contaminated sludge was mixed with soil and left in place, primarily in Impoundment 2 (the larger impoundment). The impoundments were capped with 3 ft of clay of unknown quality. Following closure of the impoundments, floating barges and aboveground storage tanks were used to store the barge washwaters.

In March 1999, sampling of the tanks in the aboveground storage tank area identified the presence of the following chemicals: acetone, benzene, 2-butanone, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, carbon tetrachloride, ethylbenzene, 4-methyl-2-pentanone, methylene chloride, naphthalene, styrene, tetrachloroethene, toluene, 1,1,1-trichloroethane, trichloroethene, Arochlor 1254, and xylenes.

The two primary hydrogeological units beneath the Gulfco site are the Chicot and Evangeline aquifers. The shallower Chicot aquifer is subdivided into two zones: the Lower and Upper Chicot. The Upper Chicot is comprised of interconnected sands that are found within 300 ft below ground surface. Ground water flow in the aquifer is reported to be to the southwest. A shallow, briny ground water zone exists within a few feet of the surface.

A number of chemicals have been detected in the uppermost ground water at the site, including benzene, carbon disulfide, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, 1,2-dichloropropane, ethylbenzene, methylene chloride, tetrachloroethene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 4-methyl-2-pentanone, trichloroethene, vinyl chloride, and xylene. Some of the chemical concentrations are greater than 10 percent of their solubility in water; therefore, the presence of nonaqueous-phase liquid is anticipated.

On 2 September 2002, EPA proposed to add the Gulfco site to the National Priorities List of Superfund sites (see Federal Register Listing FRL-7490-4, Volume 68, No. 83, Pages 23094-23101, Proposed Rule No. 39). The Final National Priorities List listing for the site was signed on 30 May 2003.

1.2.2 Scope of Work

The Scope of Work covered by this HSP includes, but is not limited to, health and safety hazards anticipated for field activities including:

- Collection of cores from the Site's existing clay cap material using a Geoprobe® rig to collect soil cores with Shelby tubes.
- If necessary, collection of wetland sediment samples to fill data gaps for existing Site data.
- Conducting a site reconnaissance as part of the ecological risk assessment and EE/CA being performed for the Task Order.

1.2.3 Potential Constituents of Concern

A brief summary of the potential constituents of concern that may be encountered during activities associated with this project are described below:

- Volatile organic compounds (VOCs)
- Semivolatile organic compounds (SVOCs)
- Organochlorine pesticides and polychlorinated biphenyls (PCBs)
- Arsenic and lead

1.3 HEALTH AND SAFETY PLAN ORGANIZATION

This HSP presents the approach to safety during execution of the project activities conducted at the site. This section presents an introduction and outlines the report organization. Section 2 summarizes the project management team. Section 3 outlines the hazard communications and environmental monitoring during field operations. Section 4 presents the required employee training. Section 5 details personal protective equipment (PPE). Section 6 summarizes emergency response reactions to site contingencies. Section 7 outlines site controls and work zones.

Prior to entering the site, this HSP must be reviewed and an agreement to comply with the requirements must be signed by all EA personnel (Appendix A). Personnel onsite will be informed of the site emergency response procedures and any potential health and safety hazards associated with site operations.

A list of personnel entering the Site will be recorded in a Daily Site Log (Appendix B). In addition, personnel will participate in the daily safety meetings and sign the Daily Safety Meeting Form (Appendix C).

2. PROJECT MANAGEMENT

This section discusses the project management roles and responsibilities for the Gulfco site.

2.1 KEY PERSONNEL

Table 1 contains information on key project personnel.

TABLE 1 PROJECT PERSONNEL

Name	Position	Work Phone	Cell Phone
Gary Miller	EPA Task Order Monitor	214-665-8318	---
Alpheus Sloan	Project Manager	972-315-3922	214-500-8525
Mark Paddack	Alternate Project Manager	972-315-3922	214-535-1844
John Bonner	Field Team Leader	713-896-4111	281-935-1638
John Bonner	Site Health and Safety Officer	713-896-4111	281-935-1638
Tim Startz	Program Manager	972-315-3922	214-616-7027
Pete Garger, CIH	Corporate Health and Safety Director	410-527-2425	410-790-6338

2.2 RESPONSIBILITIES

Clear lines of authority will be established for enforcing compliance with the health, safety, and contingency procedures consistent with industry policies and procedures.

Designated EA personnel are responsible for implementation of the HSP during field activities. This includes field supervision; enforcing safe work practices and decontamination procedures (if needed); ensuring proper use of PPE; communicating site safety program modifications and requirements to site personnel; proper reporting of injuries, illnesses, and incidents to the appropriate internal and external organizations; and containing and controlling the loss of potentially hazardous materials to soil, air, and surface/ground water during all phases of NTCRS field activities.

In the event of an onsite injury, occupational illness, near miss, or environmental contamination incident involving EA personnel, the following organizations/individuals will be notified as appropriate:

- Field Team Leader/Site Health and Safety Officer
- Project Manager
- Corporate Health and Safety Director
- Program Manager.

2.2.1 Project Manager

The ***Project Manager*** has overall responsibility for site activities and will be the primary contact during field activities. The Project Manager will regularly confer with site personnel regarding health and safety compliance.

2.2.2 Corporate Health and Safety Director

The ***Corporate Health and Safety Director*** has overall project responsibility for the development and implementation of this HSP and conformance with project requirements. The Corporate Health and Safety Director will act in an advisory capacity to the Field Team Leader and site personnel for project-specific health and safety issues.

2.2.3 Site Health and Safety Officer

The ***Site Health and Safety Officer*** is responsible for coordination of onsite contingency operations, as well as the implementation of the EA Site Health and Safety Program. The Site Health and Safety Officer will be onsite throughout the project and will be responsible for daily compliance with site health and safety requirements, including air monitoring, establishing decontamination protocols, conducting and documenting safety meetings, and ensuring that all EA personnel review the HSP and sign the HSP Review Record (Appendix A), as applicable.

In the event of an emergency situation involving EA personnel, the Field Team Leader/Site Health and Safety Officer will be responsible for initiating and coordinating emergency responses/contingency operations with the EA Site Health and Safety Officer.

The Corporate Health and Safety Director, Field Team Leader, and Site Health and Safety Officer will have the authority to make on-the-spot corrections concerning health, safety, and environmental pollution infractions.

2.2.4 Field Team Leader

The ***Field Team Leader*** reports to the EA Project Manager and Corporate Health and Safety Director. The Field Team Leader will oversee and direct field activities and has day-to-day responsibility for ensuring implementation of the HSP. The Field Team Leader's responsibilities include, but are not limited to, providing technical support, evaluating onsite environmental monitoring results, coordinating site activities, communicating with offsite emergency responders, and coordinating activities of onsite and offsite emergency responders, as applicable.

2.2.5 Employee Responsibilities

EA employees are responsible for reading, understanding, and meeting the health and safety requirements contained in this HSP. A HSP Review Record sign-off sheet is provided in Appendix A. Employees are required to implement these procedures when conducting daily operations. This will also include receiving appropriate training and medical monitoring (if required) and utilization of EA-provided health and safety equipment (to include all forms of PPE) to safely conduct site operations. Employees will review each task prior to commencement to consider the potential health and safety hazards, and the measures to be taken in the event of an emergency. Employees should know where material safety data sheets (MSDS), first aid supplies, and emergency equipment is maintained. The Field Team Leader/Site Health and Safety Officer should be notified of potential health and safety hazards, near-miss conditions, or incidents present on the job site or unusual effects believed to be related to hazardous chemical exposures. Failure to follow established health and safety procedures could result in immediate dismissal from the site and, if repeated, a potential loss of employment.

2.2.6 Subcontractors

Responsibilities of subcontractor personnel include following the HSP and applicable health and safety rules, regulations, and procedures. This may include:

- Using required controls, procedures, and safety devices, including PPE
- Notifying his/her supervisor of identified or suspected emergencies, safety, or health hazards
- Complying with training and medical requirements (if required).

Subcontractor personnel are responsible for reading, understanding, and meeting the health and safety requirements contained in this HSP in addition to their own HSP. The Health and Safety Plan Review Record in Appendix A must be signed by all subcontractors. The subcontractors may elect to prepare a HSP Addendum, or they may adopt this HSP.

2.2.7 Visitors

Site visitors will be required to comply with the requirements of this HSP and applicable health and safety rules, regulations, and procedures. Site visitors are responsible for reading, understanding, and meeting the health and safety requirements contained in this HSP. The Health and Safety Plan Review Record in Appendix A must be signed by all site visitors.

3. HAZARD EVALUATION AND CONTROL

The following is a list of field activities to be completed for this project:

1. Collect cores of the existing cap material using a Geoprobe® rig equipped with Shelby tubes.

2. If necessary, collect wetlands sediment samples to fill data gaps for existing site data. The areas to be sampled are accessible by foot.

3. Perform a Site reconnaissance as part of the Screening Level Ecological Risk Assessment (SLERA) and EE/CA being completed for the Task Order.

4. Collect soil samples from a local borrow pit that is identified as part of the EE/CA as a source for material to repair the existing Site's existing clay cap.

3.1 PHYSICAL AND BIOLOGICAL HAZARDS

Potential physical hazards and appropriate control measures are summarized in Table 2 for each of the above-listed tasks.

TABLE 2 PHYSICAL AND BIOLOGICAL HAZARD EVALUATION AND CONTROL

Hazard	Activities	Control Measures
Fire and Explosion	1, 4	• Inform personnel of the locations of potential fire/explosion hazards • Identify subsurface utility lines, if possible • Establish site-specific procedures for working around flammable materials • Ensure that appropriate fire suppression equipment and systems are available and in good condition
Heat Stress	1, 2, 3, 4	• Promote heat stress awareness • Provide cool break areas and adequate breaks • Provide non-caffeinated beverages
Cold Stress	1, 2, 3, 4	• Provide warm break area and adequate breaks • Provide non-caffeinated beverages • Promote cold stress awareness
Heavy Equipment Operations	1,4	• Ensure that the operators are properly trained and equipment has been properly inspected and maintained • Establish equipment routes, traffic pattern, and site-specific safety measures • Assign spotters and inform of proper hand signals and protocols • Wear reflective vests while working around heavy equipment • Maintain safe distances from all heavy equipment • Lifting capacities and load limits of equipment will not be exceeded • Locate “kill-switch” of the drill rig to stop the rig in case of emergency • No activities during thunderstorms • Maintain line of sight with rig operator during activities
Noise	1,4	• Maintain safe distance from the noise-generating equipment • Implement hearing protection measures • Establish noise level standards for onsite equipment
Electrical	1, 2, 3, 4	• Survey work area for the presence of buried and above-ground electrical lines. • Identify and locate areas marked for subsurface electrical lines by utility companies. • If drilling activities are to occur near overhead power lines, a safe working distance must be maintained between the drilling mast and the power line (Refer to Section 3.1.6 of this HSP for determining this distance).
Utility Lines	1, 2	• Identify and locate existing utilities prior to work • Contact local utility company, if required • Maintain safe distances from utility lines
Weather		• Site is in a location favorable for thunderstorms and flooding; field crews should be aware of predicted weather condition and periodically monitor changes in weather conditions as field work progresses.
Biological	1, 2, 3, 4	Potential hazard—poison ivy, poison oak, snakes, insect bites, and stings • Establish site-specific procedures for working around identified hazards • Avoid areas of heavy vegetation • Wear long-sleeve shirts, pants, and gloves • Use insect repellant as necessary. • Wear snake chaps or snake boots when working in areas favorable for snake habitat.

Hazard	Activities	Control Measures
Motor Boat and Water Operations	NA	• Ensure that the operators are properly trained and equipment has been properly inspected and maintained • Use life preserver when within 10 feet of water (as needed) • Have life preservers or flotation devices available for all personnel when on the water • Locate "kill-switch" of the boat to stop the motor in case of emergency • No activities during thunderstorms
Overhead Obstructions	1,4	• Wear hard hat • Reconnoiter work area and alert field personnel before execution of work
Site Debris	1, 2, 3, 4	• Trip/fall hazards exist at the site —inspect work areas for site debris and muddy conditions that can result in trip/fall hazards; walk carefully in these areas. • Wear proper PPE—hard hat, safety glass, and steel-toed boots • Watch for flying debris—wear hard hat and safety glass to protect against these debris • Work will be conducted only during daylight hours • Contact local utility company, if required

The following section provides greater detail for particular physical hazards that may potentially be present during field activities. These physical hazards may include, but are not limited to:

- Fire/explosion
- Heat/cold stress
- Heavy equipment
- Noise
- Electrical
- Utilities
- Weather
- Biological
- Motor boat and water.

The site will be visually inspected for the presence of general safety hazards (e.g., trip/slip hazards, unstable surfaces or steep grades, vehicle and pedestrian traffic, sharp objects, and water/drowning) prior to beginning work. If hazards are identified, these hazards will be recorded and precautionary measures taken to prevent injury.

3.1.1 Fire/Explosion

The potential for fire and/or explosive conditions will exist. Workers must continuously monitor the work area for combustible or explosive gases when operations have the potential to generate sparks. Employees should always be alert for unexpected events, such as ignition of chemicals or sudden release of materials under pressure, and be prepared to act in these emergencies.

NOTE: Smoking is not allowed at any time within the work area.

Company-owned field vehicles will be equipped with a fire extinguisher. Employees must be trained in the proper use of fire suppression equipment. However, professionals should handle large fires that cannot be controlled with a fire extinguisher. The proper authorities should be notified in these instances.

3.1.2 Heat Stress and Heat-Related Illness

Effects of heat stress and illness are possible during the performance of field activities at the site. Injury from heat exposure may occur to persons working outdoors during a period of high temperature conditions. This is a major concern when personnel are working in PPE clothing. The body's principal means of cooling is through the evaporation of sweat. When personnel are working in PPE, sweat is trapped inside the clothing and cannot evaporate, thus raising the body's core temperature and resulting in a heat-related illness. Monitoring will commence at temperatures of 70°F and above when employees are wearing impervious full-body clothing.

Personnel should be familiar with the signs and symptoms of heat stress. These include:

- **Heat Cramps**—Painful contraction of voluntary muscles
- **Heat Exhaustion**—Dizziness, lightheadedness, slurred speech, rapid pulse, confusion, fainting, fatigue, copious perspiration, cool skin that is sometimes pale and clammy, and nausea
- **Heat Stroke**—Hot, dry, flushed skin; delirium; and coma (in some cases).

Resting frequently in a shaded area and consuming large quantities of fresh, potable water and electrolyte replenishing fluids (i.e., Gatorade) can prevent heat stress. If heat exhaustion symptoms are observed, the person will be required to rest in a shaded area and consume liquids. If symptoms are widespread or observed frequently, an appropriate work/rest regimen will be instituted. This may involve limiting the work period so that after 1 minute of rest, a person's heart rate does not exceed 110 beats per minute.

If the heart rate is higher than 110 beats per minute, the next work period should be shortened by 33 percent, while the length of the rest period stays the same. If the heart rate is 110 beats per minute at the beginning of the next rest period, then the next cycle should be shortened by another 33 percent. Resting heart rate should be determined prior to starting onsite activities. A healthy individual's resting heart rate is usually 60-72 beats per minute. If symptoms of heat stroke are observed, the victim will be cooled immediately and transported to the nearest hospital. Workers should not hesitate to seek medical attention if heat stroke is suspected.

3.1.3 Effects of Cold Exposure

Effects of cold exposure are possible during the performance of field activities at the site. Cold stress can be caused by exposure to temperatures at or below freezing or to excessive wind at higher temperatures. When an individual's body temperature falls below 98.6°F, cold stress injuries may occur. The body's cells are composed primarily of water that can freeze when

exposed to low temperatures, resulting in cell damage or death. Primary effects of cold exposure include frostnip, frostbite, and hypothermia:

- **Frostnip** commonly occurs as a result of surface tissue freezing at the tips of the ears, nose, cheeks, chin, fingertips, and toes. Symptoms of frostnip include the appearance of white shiny skin. If frostnip occurs, gradually warm the affected areas with a warm hand or warm breath. Do not rub.

- **Frostbite** occurs as the result of surface and subsurface tissues freezing. Symptoms include erythema, blistering, throbbing pain, numbness, and swelling. If frostbite is suspected, move to a warm location and provide slow and steady re-warming.

- **Hypothermia** is the result of prolonged exposure to cold temperatures and body heat loss. Symptoms of hypothermia include body shivers, slow reaction time, mental confusion, glassy eyes, low body temperature, low pulse rate, and difficult respiration. Death can occur within 2 hours if not treated. If hypothermia is suspected, move to a warm location, remove wet and/or cold clothing, and provide re-warming as rapidly as possible. Provide both external heat (fire, electric blanket, body heat) and internal heat (hot liquids for conscious victims). Seek medical attention immediately.

In order to avoid potential cold stress, field personnel should take precautions against the cold and maintain body temperatures. This is most easily done by wearing the proper protective clothing, including insulated head and ear covering, gloves, insulated socks and/or boots, and insulated clothing in layers. If the potential exists for clothing to become wet, then the outer layer of clothing should be water repellent. Clothing that becomes wet with either water or sweat should be replaced immediately. In addition, the work area can be protected by the placement of vehicles or tarps to reduce wind chill.

3.1.4 Heavy Equipment

The use of heavy equipment (e.g., drill rigs, generators, compressors) may pose safety hazards to site workers. Only trained, experienced personnel will conduct heavy equipment work. If possible, personnel must remain outside the turning radius of large, moving equipment. At a minimum, personnel must maintain visual contact with the equipment operator. No guards, safety appliances, or other devices may be removed or made ineffective unless repairs or maintenance are required, and then only after power has been shut off and locked out. Safety devices must be replaced once repair or maintenance is complete. Exhaust from equipment must be directed so that it does not endanger workers or obstruct the view of the operator. When not operational, equipment must be set and locked so that it cannot be activated, released, dropped, etc.

Personnel are required to stand away from any vehicle being loaded or unloaded to avoid being struck by falling material. Personnel will wear highly visible, reflective vests while onsite to aid in being seen by equipment operators.

3.1.5 Noise

Work around large equipment often creates excessive noise. Noise can cause workers to be startled, annoyed, or distracted; can cause physical damage to the ear, pain, and temporary and/or permanent hearing loss; and can interfere with communication. If workers are subjected to noise exceeding an 8-hour time-weighted average sound level of 85 dBA (decibels on the A-weighted scale), hearing protection will be selected with an appropriate noise reduction rating to comply with 29 CFR 1910.95 and to reduce noise levels to or below the permissible values. Therefore, during field activities where workers are using heavy equipment, hearing protection must be utilized.

3.1.6 Electrical

Overhead power lines, electrical wiring, electrical equipment, and buried cables pose risks to workers of electric shock, burns, muscle twitches, heart fibrillation, and other physical injuries, as well as fire and explosion hazards. Workers will take appropriate protective measures when working near live electrical parts, including inspection of the work area, to identify potential spark sources, maintenance of a safe distance, proper illumination of the work areas, provision of barriers to prevent inadvertent contact, and use of nonconductive equipment. If overhead lines cannot be de-energized prior to the start of work, a 10-ft distance must be maintained between overhead energized power lines with a voltage of 50 kV and elevated equipment parts. This distance will be increased 4 in. for every 10 kV greater than 50 kV. For example, workers must maintain a distance of 11.7 ft from energized power lines with a voltage of 100 kV.

3.1.7 Utilities

Underground utilities pose hazards to workers involved in drilling and other invasive operations such as excavation. These hazards include electrical hazards, explosion, and asphyxiation, as well as costly and annoying hazards associated with damaging communication, sewer, and water lines. Prior to commencement of invasive operations, utility companies will be contacted to inspect and flag the area of investigation, if required.

Personnel should be aware that although an area may be cleared, it does not mean that unanticipated hazards will not appear. Workers should always be alert for unanticipated events such as snapping cables, drilling into unmarked underground utilities, and drilling into a heavily contaminated zone, etc. Such occurrences should prompt involved individuals to halt work immediately and take appropriate corrective measures to gain control of the situation.

3.1.8 Weather

Weather conditions should always be taken into consideration. Heavy rains, electrical storms, high winds, and extreme temperatures, for example, may create extremely dangerous situations for employees. Equipment performance may also be impaired because of inclement weather. Whenever unfavorable conditions arise, the Site Health and Safety Officer will evaluate both the

safety hazards and ability of the employees to effectively perform given tasks under such conditions. Activities will be halted at their discretion.

Wind direction should be accounted for when positioning equipment at sampling locations. If exposure to organic vapors is anticipated, workers should locate upwind of sampling points. Wind direction often changes abruptly and without warning, so personnel should always be prepared to reposition, if necessary.

3.1.9 Biological

Any grassy, freshwater marsh, or wetland area at the site may be territory for deer ticks or other insects, which may carry Lyme disease. Precautions that will be taken to reduce these hazards are clearing high vegetation within the work zones, minimizing movement through uncleared areas, wearing long pants while onsite, applying insect repellant to clothing, and checking employees' clothing and bodies for ticks periodically. Workers should be particularly sensitive to the freshwater marsh and wetland areas to ensure that there is minimal disturbance of the wetlands during sampling activities.

Due to the location of the site, the known animal species that may potentially be encountered include squirrels, skunks, rats, deer, mice, snakes, raccoon, etc. These animals are typically afraid of human beings and will stay away from workers. However, any animal that acts aggressively should be considered dangerous due to the possibility of rabies or potential infections from bites or punctures.

Poisonous plants (poison ivy, poison oak, poison sumac, etc.) may potentially be encountered at the site. Precautions should be taken to minimize exposure to plants by clearing vegetation, when necessary, within the work zone and wearing snake boots (if necessary), long-sleeve shirts, pants, safety glasses, and gloves. In addition to the biological and plant life hazards listed above, the following biohazard may be present.

During site operations, EA employees may be exposed to blood and body secretions in support of emergency response operations where site personnel have been injured, and require first aid and/or cardiopulmonary resuscitation (CPR) (see Section 6.5). Due to the potential that blood and body secretions may contain disease-causing organisms such as the Hepatitis B Virus, and Human Immunodeficiency Virus, employees electing to provide first aid and CPR support (until the arrival of a competent onsite medical responder) should take appropriate measures to reduce or eliminate their potential for contact and exposure. The concept of "Universal Precautions" will be followed, assuming a potential hazard is present. Employees providing first aid support should wear the appropriate PPE to prevent or reduce their potential for contact and exposure. This will typically be accomplished through the use of nitrile gloves, splash-proof eye protection, and the use of mouth-to-mouth guards and proper cleanup (good sanitation and hygiene) following the incident. The hands and face should be thoroughly washed with water and antiseptic soap or cleanser following an incident, or antiseptic containing disposable towelettes used in the absence of appropriate field washing facilities. The Program Health and

Safety Officer should be notified of potential employee exposure to blood and body fluids while conducting work in support of this project.

3.1.10 Motor Boat and Water

Field activities for the Task Order will not involve of motor boats and/or sample collection from surface water bodies

3.1.11 Overhead Obstructions and Site Debris

Field crews should survey the work area for overhead obstructions and wear appropriate PPE (hard hats and safety glasses) to prevent or reduce injury resulting from coming into contact with these overhead obstructions.

Portions of the site contain discarded debris and areas of thick vegetation, and much of the site is covered by fine-grained wetlands sediment, which can be slippery when wet. Due to these conditions, field crews should wear steel-toed boots that provide good traction in slippery/wet conditions. Field crews should also survey the work areas for site debris which could represent slip/fall/impaling hazards, and to the extent possible, limit accessing/working in these areas. Field crews should also watch their footing when walking/working in areas that are slippery and/or contain nearby site debris.

3.2 CHEMICAL HAZARDS

This section provides information on hazard communication, chemical hazards, and equipment for equipment calibration and operation.

3.2.1 Hazard Communication

The Site Health and Safety Officer will keep a MSDS onsite for each chemical, if any, brought onsite by EA during field activities. Chemicals brought onsite must be labeled in accordance with OSHA Hazard Communication Requirement 29 CFR 1910.

3.2.2 Chemical Hazards

Assumptions regarding potential chemical constituents were made by reviewing information from past investigation activities conducted at the site. The following chemicals were either detected at concentrations that exceeded potential human health risk-based levels or they were determined to be constituents of concern from the list of chemicals identified in Section 1.2.1.

Any newly identified constituents detected from the sampling activities will be evaluated and, if required, this HSP will be amended to address any new chemical hazards. In the absence of sufficient data, the concept of "Universal Precautions" will be followed, assuming that all potential constituents of concern are present while sampling. Concentrations detected are relatively low, and the likelihood of adverse health effects should be considered equally low.

Potential chemical hazards and their evaluation are provided in Table 3 for each of the identified activities.

TABLE 3 CHEMICAL HAZARD EVALUATION

Activity No.	Compound	Exposure Limits (Time Weighted Average)		Routes of Exposure	Symptoms (Acute)	Dermal Hazard
		Permissible Exposure Limit	Threshold Limit Value			
1, 2, 3	**Arsenic** in soil/sediment Metal: Silver-gray or tin-white, brittle, odorless solid	0.010 mg/m^3	0.010 mg/m^3	Inhalation, skin absorption, skin and/or eye contact, ingestion	Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, respiratory irritation, hyperpigmentation of skin, potential occupational carcinogen	Yes
1, 2, 3	**Benzo(a)anthracene** in soil/sediment Black or dark-brown amorphous residue	0.2 mg/m^3 benzene-soluble fraction	0.2 mg/m^3	Inhalation, skin and/or eye contact, ingestion	Dermatitis, bronchitis, potential occupational carcinogen	Yes
1, 2. 3	**Benzo(a)pyrene** in soil/sediment Black or dark-brown amorphous residue	0.2 mg/m^3 benzene-soluble fraction	0.2 mg/m^3	Inhalation, skin and/or eye contact, ingestion	Dermatitis, bronchitis, potential occupational carcinogen	Yes
1, 2, 3	**Benzo(b)fluoranthene** in soil/sediment Black or dark-brown amorphous residue	0.2 mg/m^3 benzene-soluble fraction	0.2 mg/m^3	Inhalation, skin and/or eye contact, ingestion	Dermatitis, bronchitis, potential occupational carcinogen	Yes
1, 2, 3	**Lead** in soil/sediment Gray in pure form	0.05 mg/m^3	0.15 mg/m^3	Inhalation, skin and/or eye contact, ingestion	Lassitude, insomnia, facial pallor, anorexia, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, paralysis of wrists/ankles, irritation to eyes	Yes

3.2.3 Chemicals for Equipment Calibrations and Operations

The following chemicals may be supplied by the primary field program team:

- Hydrochloric acid (sample preservative)
- Nitric acid (sample preservative)

Laboratory supplied sample jars with preservatives will be used to prevent handling of preservatives in the field.

As discussed in Section 4.3.3, the Site Health and Safety Officer will maintain a current alphabetical file of complete MSDSs for each hazardous substance stored or used at the work site by EA personnel.

3.3 SAFE WORK PRACTICES

Safe work practices that must be followed by site workers include:

- Cleaning of hands immediately, or as soon as feasible, after removal of gloves by the use of antiseptic cleanser in conjunction with clean paper towels.

- Washing of hands and any other exposed skin with antiseptic cleanser and water immediately or as soon as feasible following contact with blood or other potentially infectious material; staff will also wash hands:
  - After removing PPE
  - After handling potentially infectious materials
  - After cleaning or decontaminating equipment
  - After using the bathroom
  - Before eating
  - Before and after handling or preparing food.

- Eat, drink, and smoke only in those areas designated by the Site Health and Safety Officer. These activities will not take place within work zones.

- In the event a potential for chemical contamination exists onsite, employees will wash and conduct appropriate decontamination activities.

- Wear appropriate PPE all the time.

- Defective PPE must be repaired or replaced immediately.

- Each employee required to take prescription drugs will notify the Field Team Leader and/or Site Health and Safety Officer/Emergency Coordinator prior to the start of work. Controlled or unauthorized drugs will **not** be permitted onsite at any time.

- Procedures for sampling and/or analysis will be performed in such a manner as to minimize splashing, spraying, spattering, and generation of droplets. The slow and careful transfer of all potentially infectious liquids will accomplish this.

- Potentially infectious materials will be placed in a clearly marked container which prevents leakage during collection, handling, and transporting.

- If outside contamination of the primary container occurs, the primary container will be placed within a second container, which prevents leakage during handling and transporting.

- Equipment that may become contaminated will be decontaminated as necessary.

3.4 ENVIRONMENTAL MONITORING

Due to the site-related contaminants being bound to soil and sediment particles and planned field activities causing minimal disturbance which could the particles to become air-borne, environmental monitoring will not be required for the project. Precautions will be taken, which include use of PPE, and having personnel working upwind of drilling activities while advancing borings with Shelby tubes. If dust is observed during drilling activities or collection of wetlands sediment samples, dust masks will be utilized by field crew to minimize inhalation of the dust particles.

3.5 BUDDY SYSTEM

Work at the site will be scheduled to minimize the amount of time an employee works alone at any time. Each worker will maintain visual contact or communication with another worker during intrusive activities and/or in the exclusion zone. The buddy system will ensure against an employee becoming stressed without a co-worker being aware of his or her condition. Workers must "watch out" for each other while working close to potential chemical and physical hazards. In situations where line of sight may be limited, radio or telephone communication must be maintained at a minimum.

If a telephone is not immediately available for emergency use, an alarm or horn should be sounded to summon further help from others on the job site.

4. EMPLOYEE TRAINING

This section discusses OSHA-mandated training, medical surveillance, and hazard communication requirements for the Gulfco site.

4.1 SITE PERSONNEL

All onsite personnel who may be exposed to hazardous conditions, including EA and subcontractor personnel, as well as site visitors who will participate in onsite activities, will be required to meet the training requirements outline in 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response). Training will include:

- Minimum of 40 hours of initial offsite instruction
- Minimum of 3 days of actual field experience under the direct supervision of a trained, experienced supervisor
- 8-hour "refresher" training period annually

- Additional training that addresses unique or special hazards/operational requirements

- At least one person onsite at any time should be currently trained in first aid/cardiopulmonary resuscitation.

Onsite management and supervisors who are directly responsible for or who supervise employees will receive at least 8 additional hours of specialized management training.

Copies of training certificates and dates of attendance will be available through the Site Health and Safety Officer upon request.

4.1.1 Subcontractor Training

Prior to start of work operations, the PM will obtain a written list of subcontractor personnel to be onsite and written certification from subcontractor management that these workers meet the training requirements for their assigned tasks.

4.1.2 Pre-Entry Orientation Session

Prior to entering the Site, personnel will attend a pre-entry orientation session presented by the SHSO. Personnel will verify attendance of this meeting by signing the review record provided in Attachment A. Visitors entering designated work areas will be subject to applicable health and safety regulations during field operations at the Site. The SHSO is responsible for briefing the onsite personnel of potential hazards that may be encountered on the Site, the presence and location of the HSP, and emergency response procedures. Visitors will be under the direct supervision of the Field Team Leader/SHSO or his/her representative.

At a minimum, the pre-entry orientation session will discuss the contents of this HSP and will discuss the following items:

- Nature and degree of potential health and safety hazards associated with each task
- PPE to be worn for each task
- Decontamination procedures
- Training and medical surveillance requirements
- Safe work practices
- Emergency procedures.

A question and answer period will also be provided.

4.2 MEDICAL SURVEILLANCE

Hazardous waste site workers must have satisfactorily completed a comprehensive medical examination by a licensed physician within 12 months (or 24 months pending physician's approval) prior to the start of site operations. This information will be available onsite.

A licensed physician who is certified in Occupational Medicine by the American Board of Preventative Medicine will review medical surveillance protocol and examination results. Medical surveillance protocols will comply with 29 CFR 1910.120. The content of medical examinations will be determined by the attending physician and will be based upon the guidelines in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.* Medical examinations and consultations will be provided for employees covered by this program on the following schedule:

- Prior to field work assignment
- At least annually for employees covered by the program (or biennial with the approval of the occupational physician)
- At termination of employment or reassignment to an area where the employee would not be covered if the employee has not been examined within the past 6 months
- As soon as possible upon the development of signs or symptoms that may indicate an overexposure to hazardous substances or other health hazards, or that an unprotected person has been exposed in an emergency situation
- More frequently if the physician deems such examination necessary to maintain employee health.

An accurate record of the medical surveillance will be maintained for each employee for a period of no less than 30 years after the termination of employment. Records will be managed and maintained per recordkeeping provisions of EA's Safety and Health Program Manual. Records must include at least the following information about the employee:

- Name and social security number
- Physician's written opinions, recommendations, limitations, and test results
- Employee medical complaints related to hazardous waste operations
- Information provided to the physician by the employee concerning possible exposures, accidents, etc.

4.3 HAZARD COMMUNICATION PROGRAM

EA's hazard communication program consists of hazard communication, hazard communication labeling, material safety data sheets, and hazard communication training. Each of these elements is further explained below.

4.3.1 Hazard Communication

The SHSO will conduct regularly scheduled safety meetings with site workers to discuss the planned activities, since these activities and workers may change over the duration of the task order. The objective of instituting a Hazard Communication Program is to ensure that hazards associated with the Site and with chemicals brought onsite by EA or subcontractors are evaluated, and that information concerning these hazards is transmitted to site employees. Site personnel include EA and subcontractor employees, manufacturer's representatives, or local agency employees, and other workers who observe or perform services onsite. Employee awareness of chemical identities, health and physical hazards, properties, and characteristics is essential to safely handle chemicals and to minimize potential hazards. The Hazard Communication Program must follow OSHA requirements listed in 29 CFR 1926.59.

4.3.2 Hazard Communication Labeling

The Site Health and Safety Officer will ensure that EA containers are properly labeled and that workers know the contents of containers. Container labels will contain, at a minimum, information on name of product on container, chemical(s) in product, manufacturer's name and address, protective equipment required for the safe handling of the product, and first aid procedures in case of overexposure to product contents.

4.3.3 Material Safety Data Sheets

Material safety data sheets (MSDS) for each hazardous substance brought to, stored, or used at the work site is located in Appendix E of this Health and Safety Plan. The file will be easily accessible to all employees. Subcontractors and visitors to the work place will be informed of the existence and location of the MSDS. Workers and visitors will be instructed on how to read and understand the information shown on the MSDS. Subcontractors must inform the SHSO about hazardous substances that they bring onsite and provide MSDS.

4.3.4 Hazard Communication Training

Site workers and visitors will be informed of the Hazard Communication Program, their legal rights under the program, the location of the chemical inventory, and the location of the material safety data sheets file. Prior to site work or potential exposure to hazardous substances, the SHSO will describe hazardous substances routinely used and provide information about:

- Nature of potential chemical hazards
- Appropriate work practices
- Appropriate control programs
- Appropriate protective measures
- Methods to detect presence or release of hazardous substances
- Emergency procedures.

5. PERSONAL PROTECTIVE EQUIPMENT

This section describes the PPE requirements for field activities at the Gulfco site.

5.1 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Based upon currently available information and the nature of the anticipated tasks, the level of protection selected for all the work tasks is Level D.

In the event that potential chemical hazards are identified, the level of protection may be upgraded appropriately to the potential hazard conditions by the Site Health and Safety Officer. Only those personnel identified and qualified for hazardous waste work as defined in 29 CFR 1910.120 will be allowed to upgrade beyond Level D or provide support of hazardous material/ substance contingency operations. Only the EA Site Health and Safety Officer will be allowed to approve PPE upgrade for EA personnel beyond Level D and site re-entry for the purpose of hazardous conditions assessment.

The following is a list of the Level D PPE components for the minimum level of protection authorized for use during this project:

- Coveralls or appropriate work clothes
- Steel-toe, steel-shank safety boots/shoes
- Hard hats (if overhead hazards are present)
- Chemical resistant gloves (neoprene or nitrile) as appropriate to prevent contact during sample collection activities
- Leather work gloves (as needed)
- Safety glasses with side shields and face shield (as needed) or impact-resistant chemical goggles; safety glasses, goggles, and face shields will meet American National Standards Institute requirements for impact resistance and safety
- Hearing protectors (as needed) (NOTE: Hearing protection must be available and must be worn whenever noise levels exceed 85 dBA [noise level at which a shouted conversation cannot be understood at a 1-ft distance]).

5.2 MAINTENANCE AND IN-USE INSPECTION OF PERSONAL PROTECTIVE EQUIPMENT

Effective use of protective equipment requires that the equipment be properly used, maintained, and inspected periodically during the day. Site-specific issues and standard procedures will be reiterated during pre-entry training. Gloves and body coverings will be regularly inspected and

replaced promptly if torn. Disposable coveralls will be replaced daily at a minimum. Reusable gloves will be decontaminated whenever exiting the area.

6. EMERGENCY RESPONSE AND REACTION TO SITE CONTINGENCIES

This section details emergency response actions and provides site-specific emergency procedures.

6.1 EMERGENCY RECOGNITION

Prior to work startup, personnel must be familiar with emergency condition identification, notification, and response procedures. The emergency telephone numbers for local emergency response and reporting organizations are provided in Table 4. Figure 1 shows directions to the nearest hospital.

TABLE 4 EMERGENCY TELEPHONE NUMBERS

Organization	Phone Number
Emergency – Ambulance	911
Non-Emergency	979-297-4411
Freeport Fire Department	911 or 979-239-1211
Freeport Police Department	911 or 979-239-1211
Freeport City Hall	979-233-2111
Hospital – Brazosport Memorial Hospital	General: 979-297-4411 Emergency: 911 100 Medical Drive Lake Jackson, Texas 77566
Texas Commission on Environmental Quality	512-239-1000 (Austin, TX)
Directions to Hospital: From site, (906 Marlin Lane, Freeport, TX 77541), travel southwest on Marlin Lane approximately 0.7 mile. The road becomes Tarpon Lane; travel on Tarpon Lane for approximately 0.2 mile. Turn right (west) on Sailfish Street for approximately 0.1 mile and turn right (north) onto SR-332. Travel on SR-332 for approximately 11.1 miles and turn left (west) onto Plantation Drive. Travel on Plantation Drive for approximately 0.7 mile. The road name changes to Medical Drive. Arrive at 100 Medical Drive, Lake Jackson, Texas.	

EA Project Personnel			
Name	Position	Work Phone	Cell Phone
Alpheus Sloan	Project Manager	972-315-3922	214-500-8525
Mark Paddack	Alternate Project Manager	972-315-3922	214-535-1844
John Bonner	Field Team Leader	713-896-4111	281-935-1638
John Bonner	Site Health and Safety Officer	713-896-4111	281-935-1638
Tim Startz	Program Manager	972-315-3922	214-616-7027
Pete Garger, CIH	Corporate Health and Safety Director	410-527-2425	410-790-6338
EPA Project Personnel			
Name	Position	Work Phone	Cell Phone
Gary Miller	EPA Region 6 Task Order Monitor	214-665-8318	---

The Field Team Leader/Site Health and Safety Officer will rehearse/review emergency procedures and/or applicable site contingencies prior to initiation of field activities. Offsite emergency personnel will ultimately handle onsite emergencies. Initial response and first aid treatment, however, will be provided onsite.

Person(s) identifying an accident, injury, emergency condition, or a scenario requiring implementation of a response in support of this HSP will immediately take actions to report the situation to the Field Team Leader/Site Health and Safety Officer. Notification may take place by runner, hand-held radio, or cell phone. The Field Team Leader/Site Health and Safety Officer will initiate the required response based upon the type of incident, following the procedures contained in this HSP. Chain-of-command and sign-in sheets for personnel on the site will be established at the beginning of each work day to ensure personnel are accounted for and who will take control should the Field Team Leader/Site Health and Safety Officer become injured. The following items constitute those site conditions requiring an emergency response or contingency action in accordance with this HSP:

- Fire/explosion
- Heavy equipment accident
- Natural disaster
- Medical emergency
- Discovery of unanticipated hazards (e.g., unmarked utility lines, heavily contaminated material).

Follow-on operations to evaluate and control the source of fire, explosion, and hazardous material incidents will occur only after discussion with the EA Project Manager, Field Team Leader/Site Health and Safety Officer, and Program Health and Safety Officer, along with EPA personnel.

The Field Team Leader/Site Health and Safety Officer will act as the emergency coordinator at the site to coordinate onsite activities and contingencies with outside response organizations. If the Field Team Leader is unable to act as the Emergency Coordinator, then the authority to take action will be transferred to the other designee, as indicated in the daily updated chain-of-command.

6.2 PRE-EMERGENCY PLANNING

The Site Health and Safety Officer will contact applicable local emergency response organizations contained in Table 4 prior to beginning of the project to identify the emergency response requirements and commitments required to support this project. The Project Manager, or designee, will contact those local authorities potentially required to respond in the event of an onsite emergency incident or contingency. This notification will inform each applicable agency

of the starting date, anticipated scope of work, and existence of the HSP. A copy of the HSP will be made available to each emergency response agency upon request to the Project Manager. Emergency activities will be coordinated (as applicable) with the local emergency planning committee, as required in accordance with Superfund Amendments and Reauthorization Act Title III requirements.

6.3 OPERATIONS SHUTDOWN

The Site Health and Safety Officer may mandate operations shutdown in coordination with EPA. Conditions warranting work stoppage will include (but are not limited to):

- Fire
- Explosion
- Uncovering potentially dangerous buried hazardous materials
- Conditions immediately dangerous to life and health or the environment
- Potential for electrical storms
- Treacherous weather-related conditions
- Limited visibility
- Air contaminant concentrations in excess of the action levels contained in Table 3
- Upgrading of site security threat conditions.

6.4 PROCEDURES FOR HANDLING EMERGENCY INCIDENTS

In the event of an emergency, the information available at that time must be properly evaluated and the appropriate steps taken to implement the emergency response plan as outlined in this HSP. The Site Health and Safety Officer will assume command of the situation in coordination with EPA. He/she will alert the emergency management system per Table 4, and evacuate personnel to the pre-designated evacuation location. The Site Health and Safety Officer/Emergency Coordinator will make required notifications to include, but not be limited to, the EA Project Manager, EA Program Health and Safety Officer, EPA Points-of-Contact, and the appropriate federal and state agencies, as applicable.
Site personnel will have the capability of notifying emergency responders directly from the site using the onsite cell phone.

The Project Manager will complete and submit to EPA an Accident/Loss and Incident Report (Appendix D), within 24 hours. The following information will be provided when reporting an emergency:

- Name and location of person reporting
- Location of accident/incident
- Name and affiliation of injured party
- Description of injuries, fire, spill, or explosion
- Status of medical aid and/or other emergency control efforts
- Details of chemicals involved
- Summary of accident, including suspected cause and time it occurred

- Temporary control measures taken to minimize further risk.

This information is not to be released under any circumstances to parties other than those listed in this section and emergency response team members. Once emergency response agencies have been notified, the Project Manager and EPA will be immediately notified.

6.5 MEDICAL EMERGENCIES

Personnel should always be alert for signs and symptoms of illnesses related to chemical, physical, and onsite health hazards. Severe injuries resulting from accidents must be recognized as emergencies and treated as such. At least one person currently trained in first aid/CPR must be present onsite during the field activities. This will normally be the Site Health and Safety Officer.

In a medical emergency, the EA Site Health and Safety Officer must sound the emergency alarm, upon which work must stop and personnel must move to the predesignated evacuation location. **If the emergency situation cannot be conveyed by word of mouth, a whistle or other horn will be sounded. Three short blasts, separated by a 2-second silence, will be used as the emergency signal.** Personnel currently trained in first aid will evaluate the nature of the injury, decontaminate the victim (if necessary), and initiate first aid assistance immediately and transport if appropriate. First aid will be administered only to limit further injury and stabilize the victim. The local Emergency Medical Services must be notified immediately if needed.

Although not anticipated, victims who are heavily contaminated with toxic or dangerous materials must be decontaminated before being transported from the site. Decontamination will consist of removal of contaminated coveralls/clothing, and wrapping the victim in a sheet or other clothlike material. No persons will re-enter the site of injury/illness until the cause of the injury or symptoms has been determined and controlled. At no time will personnel transport victims to emergency medical facilities unless the injury does not pose an immediate threat to life and transport to the emergency medical facility can be accomplished without the risk of further injury. Emergency Medical Services will be used to transport serious injuries offsite unless deemed otherwise by the EA Site Health and Safety Officer/Emergency Coordinator.

The EA Site Health and Safety Officer/Emergency Coordinator must complete an Accident/Loss and Incident Report (Appendix D) and submit it to the Project Manager within 24 hours of the following types of incidents involving EA staff:

- Job-related injuries and illnesses
- Accidents resulting in loss or damage to property
- Accidents involving vehicles and/or vessels, whether or not they result in damage to property or personnel

- Accidents in which there may have been no injury or property damage, but which have a high probability of recurring with at least a moderate risk to personnel or property
- Near-miss incidents that could have resulted in any of the conditions defined above.

An accident that results in a fatality or the hospitalization of three or more employees must be reported within 8 hours to the U.S. Department of Labor through the Project Manager and Program Health and Safety Officer. Subcontractors are responsible for their reporting to the U.S. Department of Labor.

In order to support onsite medical emergencies, EA will have first aid/emergency medical equipment available onsite, which may include the following:

- Portable emergency eyewash.
- One 20-lb multipurpose (ABC-rated) fire extinguisher
- An adequately stocked first aid kit
- Adequate supplies of potable water for decontamination, personal hygiene, and emergency use
- An emergency siren or horn
- Copy of this EA HSP

EA personnel will carry a cell phone and the copy of this EA HSP during all onsite activities.

6.6 FIRE/EXPLOSION EMERGENCIES

Fire and explosion must be immediately recognized as an emergency. The EA Site Health and Safety Officer must sound an emergency signal, and personnel must be decontaminated (if necessary) and evacuated to the pre-designated evacuation location. Only persons properly trained in fire suppression and other emergency response procedures will support control activities. Control activities will consist of the use of onsite portable fire extinguishers for limited fire suppression and employee evacuation. Upon sounding the emergency alarm, personnel will evacuate the hazard location and assemble at the designated site meeting area. Only the EA Site Health and Safety Officer, or those site personnel trained in the use of portable fire extinguishers, will attempt to suppress a site fire. Small, multi-purpose dry chemical extinguishers will be maintained in each EA company-owned vehicle onsite. Fires not able to be extinguished using onsite extinguishers will require the support of the local Fire Department. The EA Site Health and Safety Officer should take measures to reduce injury and illness by evacuating personnel from the hazard location as quickly as possible. The EA Site Health and Safety Officer must then notify the local Fire Department. The EA Site Health and Safety Officer will determine proper followup actions. Site personnel will not resume work during or after a fire/explosion incident until the EA Site Health and Safety Officer has directed that the

incident is over and work may resume. During the incident, site personnel will remain outside the incident area and obey the instructions of the EA Site Health and Safety Officer.

6.7 EMERGENCY TELEPHONE NUMBERS

Communications will be via cell phone onsite or offsite telephone (if cellular coverage is poor in the area) for field personnel to contact offsite emergency response organizations. Refer to Table 4 for a listing of emergency telephone numbers.

6.8 CONTROL OF SITE PRODUCED AMBIENT NOISE LEVELS

Not Applicable

7. SITE CONTROL AND WORK ZONES

The following work zones will be established by EA during implementation of the field activities as a means of site control. Work zones will be established, if needed, during the sampling, removal, and disposal of hazardous waste/sludge from the site, in accordance with the following:

- **Exclusion Zone (EZ)**—This area has either known or potential contamination and has the highest potential for exposure to chemicals onsite. The EZ will be the area immediately around the sampling activities. The outer boundary of the EZ is called the hotline. The hotline separates the area of known or potential contamination from the rest of the site. The hotline should initially be established by visually surveying the site for signs of contamination, providing sufficient space to protect personnel outside the zone, allowing an adequate area in which to conduct site operations, and for reducing the potential for contaminant migration. The hotline will be physically secured or clearly marked. During subsequent site operations, the boundary may be adjusted as more

  information becomes available. Persons who enter the EZ must wear the appropriate level of PPE for the degree and types of hazards present at the site.

- **Contamination Reduction Zone (CRZ)**—One access point to the EZ designated by the EA Site Health and Safety Officer.

  The purpose of the CRZ is to reduce the possibility that the Support Zone (SZ) will become contaminated or affected by the site hazards. Because of both distance and decontamination procedures, the degree of contamination in the CRZ generally will decrease as one moves from the hotline to the SZ.

  The CRZ will be established outside the areas of known or potential contamination. Contamination Reduction Corridors, which are access control points between the EZ and CRZ, should be established for both personnel and heavy equipment. These corridors

should consist of an appropriate number of decontamination stations necessary to address the contaminants of the particular site (see National Institute of Occupational Safety and Health/OSHA/U.S. Coast Guard/EPA *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985 for information on decontamination procedures and work zones).

- **Support Zone**—Uncontaminated area and may include site vehicles.

  The SZ is the uncontaminated area where workers are unlikely to be exposed to hazardous substances or dangerous conditions. The SZ is the appropriate location for the equipment and supply center and other administrative or support functions that are necessary to keep site operations running efficiently.

  Potentially contaminated clothing, equipment, and samples must remain outside the SZ until decontaminated. However, personnel located in the SZ must receive instruction in proper evacuation procedures in case of a hazardous substance emergency. The SZ should be upwind and as far from the EZ as practicable.

The level of PPE will depend upon the type of work performed and site monitoring data, in compliance with this HSP. Level D will be the minimum protection in the EZ. The CRZ will require a minimum Level D. No specific PPE requirements are needed in the SZ, as contaminated materials are prohibited from being stored in this area. Only authorized personnel will be permitted in the EZ and CRZ. Entering these zones will require donning the required PPE prior to entry. These zones will be established prior to beginning the field activities.

Exiting the EZ will require going through decontamination in the CRZ.

Safe work practices to be followed by site workers include:

- Eating, drinking, chewing gum or tobacco, and smoking are prohibited in all the three zones at any given time.
- Hands and face must be thoroughly washed upon leaving the work area.
- Personnel must not take prescription drugs unless specifically approved by a licensed physician who is familiar with the issues of worker exposure to hazardous materials.
- When respirators are required, facial hair that interferes with the face-to-facepiece fit of the respirator will not be permitted.
- Work is allowed during daylight hours only, unless adequate alternate lighting is provided that is compliant with OSHA 29 CFR 1926.56(a).

- If dust is being visually generated in the EZ, the EA Site Health and Safety Officer will advise on procedures for misting or wetting the soil to prevent possible exposure from inhalation of soil contaminants.

- Possessing, using, purchasing, distributing, selling, or having controlled substances in one's system during the workday, including meal or break periods onsite, is strictly prohibited.

- The use or possession of alcoholic beverages onsite is prohibited; similarly, reporting to work or performing one's job assignments with excessive levels of alcohol in one's system will not be permitted.

Figures

Figure 1
Site Location Map

Gulfco Marine Maintenance Superfund Site
Freeport, Brazoria County, Texas

2010-11-22 r:\federal\epa\rac iii\0067-gulfco ntcrs\gis\mxds\sitelocation_a.mxd EA-Dallas jschwertz

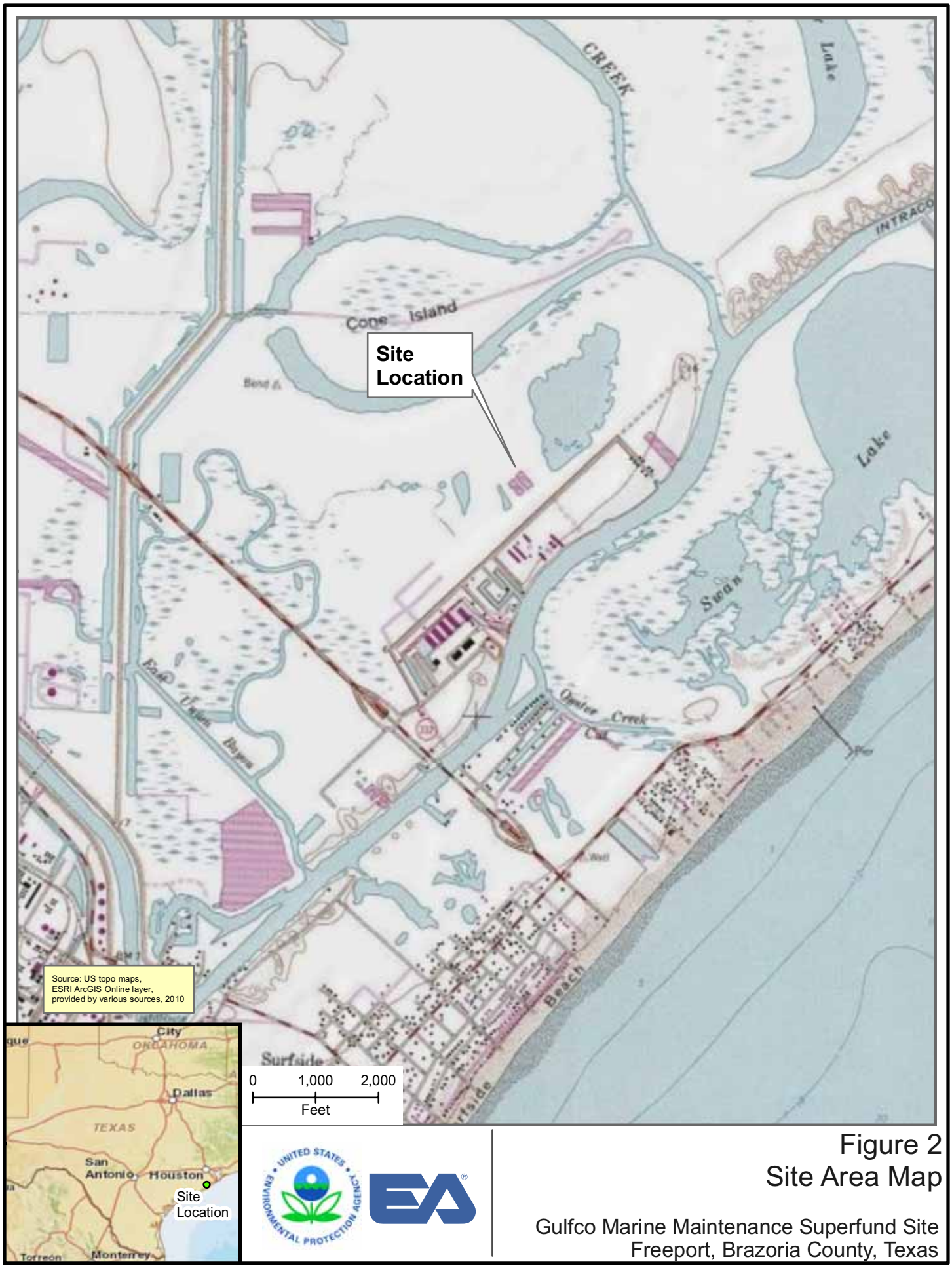
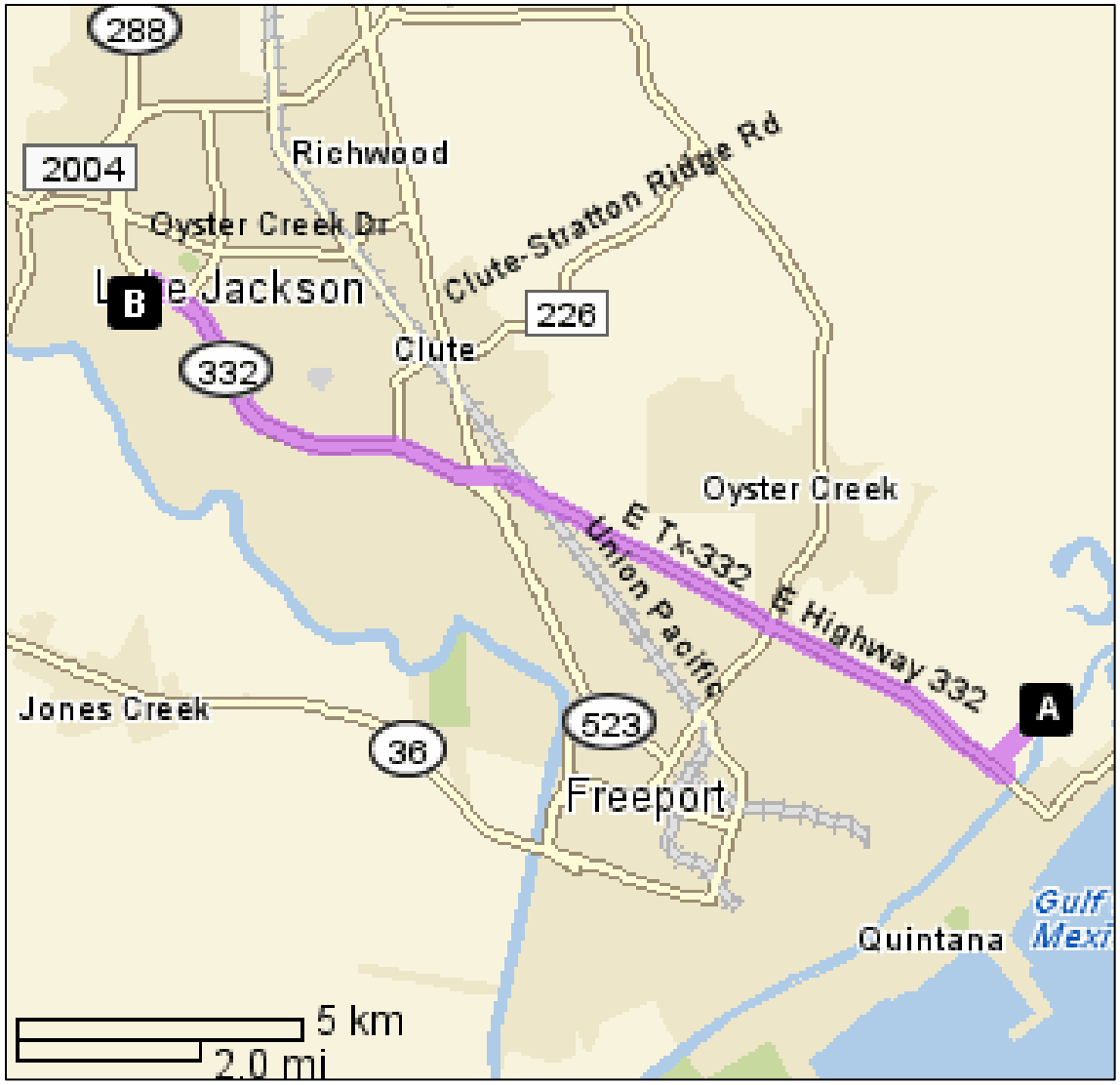


Figure 2
Site Area Map

Gulfco Marine Maintenance Superfund Site
Freeport, Brazoria County, Texas

2010-11-22 r:\federal\epa\rac iii\0067-gulfco ntcrs\gis\mxds\siteloctopo_a.mxd EA-Dallas jschwertz

DIRECTIONS TO BRAZOSPORT MEMORIAL HOSPITAL



Directions to Hospital: From site, (906 Mrlin Lane, Freeport, TX 77541), travel southwest on Marlin Lane approximately 0.7 mile. The road becomes Tarpon Lane; travel on Tarpon Lane for approximately 0.2 mile. Turn right (west) on Sailfish Street for approximately 0.1 mile and turn right (north) onto SR-332. Travel on SR-332 for approximately 11.1 miles and turn left (west) onto Plantation Drive. Travel on Plantation Drive for approximately 0.7 mile. The road name changes to Medical Drive. Arrive at 100 Medical Drive, Lake Jackson, Texas.

Figure 3 – Directions to Hospital

Appendix A

Site Health and Safety Plan Review Record

APPENDIX A

HEALTH AND SAFETY PLAN REVIEW RECORD

I have read the Health and Safety Plan for this site and have been briefed on the nature, level, and degree of exposure likely as a result of participation in this project. I agree to conform to all the requirements of this Plan.

SITE: Gulfco Marine Maintenance, Freeport, Brazoria County, Texas			
Name	Signature	Affiliation	Date

Appendix B

Daily Site Log

DAILY SITE LOG

Site Name: Gulfco Marine NTCRS _____ **Date:** _____

Name (Print and Sign)	Company (City and State)	Time	
		In	Out

Comments:

_____

_____

_____

Appendix C

Daily Safety Meeting Form

DAILY SAFETY MEETING FORM

Date:_____ **Time:** _____**Project No.:** _____

Site Name/Location: _____

Site Activities Planned for Today: _____

_____

Safety Topics Discussed
Protective clothing and equipment:
Chemical hazards:
Physical hazards:
Environmental and biohazards:
Equipment hazards:
Decontamination procedures:
Other:
Review of emergency procedures and comments:

DAILY SAFETY MEETING FORM (CONTINUED)

Attendees	
Printed Name	**Signature**

Meeting Conducted by:

_____ _____

Name Title

_____

Signature

Appendix D

Accident/Loss and Incident Report

ACCIDENT/LOSS REPORT

THIS REPORT MUST BE COMPLETED BY THE INJURED EMPLOYEE OR SUPERVISOR AND FAXED TO EA CORPORATE HUMAN RESOURCES WITHIN 24 HOURS OF ANY ACCIDENT. THE FAX NUMBER IS **(410) 771-1780**.

NOTE WHENEVER AN EMPLOYEE IS SENT FOR MEDICAL TREATMENT FOR A WORK RELATED INJURY OR ILLNESS, PAGE 4 OF THIS REPORT MUST ACCOMPANY THAT INDIVIDUAL TO ENSURE THAT ALL INVOICES/BILLS/CORRESPONDENCE ARE SENT TO HUMAN RESOURCES FOR TIMELY RESPONSE.

a. DEMOGRAPHIC INFORMATION:

NAME OF INJURED EMPLOYEE:_____
HOME ADDRESS:_____
HOME PHONE:_____ DATE OF BIRTH:_____
AGE:_____ SEX: M F
MARITAL STATUS:_____ NAME OF SPOUSE (if applicable)_____
SOCIAL SECURITY NUMBER:_____ DATE OF HIRE:_____
NUMBER OF DEPENDENTS:_____
EMPLOYEES JOB TITLE:_____
DEPT. REGULARLY EMPLOYED:_____
WAS THE EMPLOYEE INJURED ON THE JOB: Y N
PRIMARY LANGUAGE OF THE EMPLOYEE: _____

b. ACCIDENT/INCIDENT INFORMATION:

DATE OF ACCIDENT:_____ TIME OF ACCIDENT:_____
REPORTED TO WHOM: _____ NAME OF SUPERVISOR_____
EXACT LOCATION WHERE ACCIDENT OCCURRED (**including street, city, state and County**):
EXPLAIN WHAT HAPPENED (include what the employee was doing at the time of the accident and how the accident occurred): _____
_____
_____
_____

DESCRIBE THE INJURY AND THE SPECIFIC PART OF THE BODY AFFECTED (i.e., laceration, right hand, third finger):
_____
_____

OBJECT OR SUBSTANCE THAT DIRECTLY INJURED EMPLOYEE:_____
NUMBER OF DAYS AND HOURS EMPLOYEE USUALLY WORKS PER WEEK:_____
IS THE EMPLOYEE EXPECTED TO LOSE AT LEAST ONE FULL DAY OF WORK?_____
DOES THE EMPLOYEE HAVE A PREVIOUS CLAIM? Y N if yes, STATUS Open Closed
WAS THE EMPLOYEE ASSIGNED TO RESTRICTED DUTY? _____

c. ACCIDENT INVESTIGATION INFORMATION

WAS SAFETY EQUIPMENT PROVIDED? Y N If yes, was it used? Y N
WAS AN UNSAFE ACT BEING FORMED ? Y N If yes, describe_____
WAS A MACHINE PART INVOLVED? Y N If yes, describe _____
WAS THE MACHINE PART DEFECTIVE? Y N If yes, in what way _____
WAS A 3RD PARTY RESPONSIBLE FOR THE ACCIDENT/INCIDENT? Y N
If yes, list Name, address and phone number_____
_____
WAS THE ACCIDENT/INCIDENT WITNESSED? Y N
If yes, list Name, address and phone number: _____
_____

d. PROVIDER INFORMATION

WAS FIRST AID GIVEN ON SITE? Y N
If yes, what type of medical treatment was given _____
PHYSICIAN INFORMATION (if medical attention was administered)
NAME:_____
ADDRESS (incl. City, state and zip):_____
PHONE:_____

HOSPITAL ADDRESS (incl. Name, address, city, state, zip code & phone)
_____
_____

WAS THE EMPLOYEE HOSPITALIZED? Y N If yes, on what date_____
WAS THE EMPLOYEE TREATED AS AN OUTPATIENT, RECEIVE EMERGENCY TREATMENT OR AMBULANCE SERVICE? _____

PLEASE ATTACH THE PHYSICIANS WRITTEN RETURN TO WORK SLIP

***NOTE* A PHYSICIANS RETURN TO WORK SLIP IS REQUIRED PRIOR TO ALLOWING THE WORKER TO RETURN TO WORK**

e. AUTOMOBILE ACCIDENT INFORMATION (complete if applicable)

AUTHORITY CONTACTED AND REPORT #_____
EA EMPLOYEE VEHICLE YEAR, MAKE AND MODEL_____

V.I.N._____ PLATE/TAG #_____
OWNER'S NAME AND ADDRESS:_____
DRIVER'S NAME AND ADDRESS: _____
RELATION TO INSURED:_____DRIVER'S LICENSE #_____
DESCRIBE DAMAGE TO YOUR PROPERTY:_____
DESCRIBE DAMAGE TO OTHER VEHICLE OR PROPERTY:_____
OTHER DRIVER'S NAME AND ADDRESS: _____
OTHER DRIVER'S PHONE:_____
OTHER DRIVER'S INSURANCE COMPANY AND PHONE:_____
LOCATION OF OTHER VEHICLE:_____
NAME, ADDRESS AND PHONE OF OTHER INJURED PARTIES:_____
WITNESSES

NAME:_____ PHONE:_____
ADDRESS:_____
STATEMENT:_____
SIGNATURE: _____

NAME:_____ PHONE:_____
ADDRESS:_____
STATEMENT:_____
SIGNATURE: _____

f. ACKNOWLEDGEMENT

NAME OF SUPERVISOR:_____
DATE OF THIS REPORT: _____ REPORT PREPARED BY:_____

I have read this report and the contents as to how the accident/loss occurred is accurate to the best of my knowledge.

Signature: _____ Date: _____
Injured Employee

I am seeking medical treatment for a work related injury/illness.

Please forward all bills/invoices/correspondence to:

EA ENGINEERING, SCIENCE, AND TECHNOLOGY, INC.

11019 McCORMICK ROAD

HUNT VALLEY, MD 21031

ATTENTION: Michele Bailey
HUMAN RESOURCES

(410) 584-7000

INCIDENT REPORT

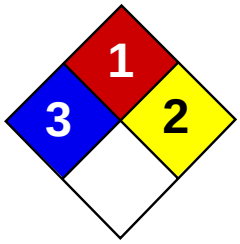
THIS REPORT IS TO BE COMPLETED WHEN A NEAR MISS OCCURS THAT COULD HAVE POTENTIALLY RESULTED IN SERIOUS PHYSICAL HARM. PLEASE FAX THIS FORM TO EA HUMAN RESOURCES DEPARTMENT AT **(410) 771-1780**.

EXPLAIN WHAT HAPPENED (include what the employee was doing at the time the near miss and how it occurred: _____

REPORT PREPARED BY: _____ DATE:_____

Appendix E

Material Safety Data Sheets



Health	3
Fire	1
Reactivity	2
Personal Protection	E

Material Safety Data Sheet
Arsenic MSDS

Section 1: Chemical Product and Company Identification

Product Name: Arsenic

Catalog Codes: SLA1006

CAS#: 7440-38-2

RTECS: CG0525000

TSCA: TSCA 8(b) inventory: Arsenic

CI#: Not applicable.

Synonym:

Chemical Name: Arsenic

Chemical Formula: As

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Arsenic	7440-38-2	100

Toxicological Data on Ingredients: Arsenic: ORAL (LD50): Acute: 763 mg/kg [Rat]. 145 mg/kg [Mouse].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant), of eye contact (irritant).

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to kidneys, lungs, the nervous system, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat, of oxidizing materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards:
Material in powder form, capable of creating a dust explosion. When heated to decomposition it emits highly toxic fumes.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable

protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.01 from ACGIH (TLV) [United States] [1995] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Lustrous solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 74.92 g/mole

Color: Silvery.

pH (1% soln/water): Not applicable.

Boiling Point: Not available.

Melting Point: Sublimation temperature: 615°C (1139°F)

Critical Temperature: Not available.

Specific Gravity: 5.72 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water, hot water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Incompatibility with various substances: Reactive with oxidizing agents, acids, moisture.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 145 mg/kg [Mouse].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A1 (Confirmed for human.) by ACGIH. Causes damage to the following organs: kidneys, lungs, the nervous system, mucous membranes.

Other Toxic Effects on Humans:
Very hazardous in case of ingestion, of inhalation. Slightly hazardous in case of skin contact (irritant).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans: Not available.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Section 14: Transport Information

DOT Classification: CLASS 6.1: Poisonous material.

Identification: : Arsenic UNNA: UN1558 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Arsenic California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Arsenic Pennsylvania RTK: Arsenic Massachusetts RTK: Arsenic TSCA 8(b) inventory: Arsenic

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R22- Harmful if swallowed. R45- May cause cancer.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 1

Reactivity: 2

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 1

Reactivity: 2

Specific hazard:

Protective Equipment:
Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Liste des produits purs tératogènes, mutagènes, cancérogènes. Répertoire toxicologique de la Commission de la Santé et de la Sécurité du Travail du Québec. -Material safety data sheet emitted by: la Commission de la Santé et de la Sécurité du Travail du Québec. -SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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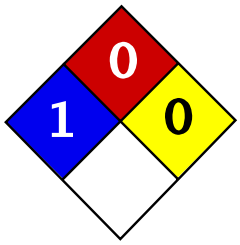
Last Updated: 11/06/2008 12:00 PM



Health	1
Fire	0
Reactivity	0
Personal Protection	E

Material Safety Data Sheet
Lead MSDS

Section 1: Chemical Product and Company Identification

Product Name: Lead

Catalog Codes: SLL1291, SLL1669, SLL1081, SLL1459, SLL1834

CAS#: 7439-92-1

RTECS: OF7525000

TSCA: TSCA 8(b) inventory: Lead

CI#: Not available.

Synonym: Lead Metal, granular; Lead Metal, foil; Lead Metal, sheet; Lead Metal, shot

Chemical Name: Lead

Chemical Formula: Pb

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Lead	7439-92-1	100

Toxicological Data on Ingredients: Lead LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects: Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (permeator).
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.

Skin Contact: Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops.

Serious Skin Contact: Not available.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation: Not available.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: May be combustible at high temperature.

Auto-Ignition Temperature: Not available.

Flash Points: Not available.

Flammable Limits: Not available.

Products of Combustion: Some metallic oxides.

Fire Hazards in Presence of Various Substances: Non-flammable in presence of open flames and sparks, of shocks, of heat.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: When heated to decomposition it emits highly toxic fumes of lead.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:
Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

Large Spill:
Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system. Be careful that the product is not

present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection: Safety glasses. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 0.05 (mg/m3) from ACGIH (TLV) [United States]
TWA: 0.05 (mg/m3) from OSHA (PEL) [United States]
TWA: 0.03 (mg/m3) from NIOSH [United States]
TWA: 0.05 (mg/m3) [Canada]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Metal solid.)

Odor: Not available.

Taste: Not available.

Molecular Weight: 207.21 g/mole

Color: Bluish-white. Silvery. Gray

pH (1% soln/water): Not applicable.

Boiling Point: 1740°C (3164°F)

Melting Point: 327.43°C (621.4°F)

Critical Temperature: Not available.

Specific Gravity: 11.3 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility: Insoluble in cold water.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, excess heat

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Can react vigorously with oxidizing materials.
Incompatible with sodium carbide, chlorine trifluoride, trioxane + hydrogen peroxide, ammonium nitrate, sodium azide, disodium acetylide, sodium acetylide, hot concentrated nitric acid, hot concentrated hydrochloric acid, hot concentrated sulfuric acid, zirconium.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified A3 (Proven for animal.) by ACGIH, 2B (Possible for human.) by IARC.
May cause damage to the following organs: blood, kidneys, central nervous system (CNS).

Other Toxic Effects on Humans: Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:
Acute Potential:
Skin:
Lead metal granules or dust: May cause skin irritation by mechanical action.
Lead metal foil, shot or sheets: Not likely to cause skin irritation
Eyes:
Lead metal granules or dust: Can irritate eyes by mechanical action.

Lead metal foil, shot or sheets: No hazard. Will not cause eye irritation.
Inhalation:
In an industrial setting, exposure to lead mainly occurs from inhalation of dust or fumes.
Lead dust or fumes: Can irritate the upper respiratory tract (nose, throat) as well as the bronchi and lungsby mechanical action. Lead dust can be absorbed through the respiratory system. However, inhaled lead does not accumulate in the lungs. All of an inhaled dose is eventually abssorbed or transferred to the gastrointestinal tract. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include metallic taste, chest pain, decreased physical fitness, fatigue, sleep disturbance, headache, irritability, reduces memory, mood and personality changes, aching bones and muscles, constipation, abdominal pains, decreasing appetite. Inhalation of large amounts may lead to ataxia, deliriuim, convulsions/seizures, coma, and death.
Lead metal foil, shot, or sheets: Not an inhalation hazard unless metal is heated. If metal is heated, fumes will be released. Inhalation of these fumes may cause "fume metal fever", which is characterized by flu-like symptoms. Symptoms may include metallic taste, fever, nausea, vomiting, chills, cough, weakness, chest pain, generalized muscle pain/aches, and increased white blood cell count.
Ingestion:
Lead metal granules or dust: The symptoms of lead poisoning include abdominal pain or cramps (lead cholic), spasms, nausea, vomiting, headache, muscle weakness, hallucinations, distorted perceptions, "lead line" on the gums, metallic taste, loss of appetite, insomnia, dizziness and other symptoms similar to that of inhalation. Acute poisoning may result in high lead levels in the blood and urine, shock, coma and death in extreme cases.
Lead metal foil, shot or sheets: Not an ingestion hazard for usual industrial handling.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Not a DOT controlled material (United States).

Identification: Not applicable.

Special Provisions for Transport: Not applicable.

Section 15: Other Regulatory Information

Federal and State Regulations:
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause reproductive harm (female) which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to

cause reproductive harm (male) which would require a warning under the statute: Lead
California prop. 65 (no significant risk level): Lead: 0.0005 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Lead
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Lead
Connecticut hazardous material survey.: Lead
Illinois toxic substances disclosure to employee act: Lead
Illinois chemical safety act: Lead
New York release reporting list: Lead
Rhode Island RTK hazardous substances: Lead
Pennsylvania RTK: Lead

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):
R20/22- Harmful by inhalation and if swallowed.
R33- Danger of cumulative effects.
R61- May cause harm to the unborn child.
R62- Possible risk of impaired fertility.
S36/37- Wear suitable protective clothing and gloves.
S44- If you feel unwell, seek medical advice (show the label when possible).
S53- Avoid exposure - obtain special instructions before use.

HMIS (U.S.A.):

Health Hazard: 1

Fire Hazard: 0

Reactivity: 0

Personal Protection: E

National Fire Protection Association (U.S.A.):

Health: 1

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Lab coat.
Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Safety glasses.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

Created: 10/10/2005 08:21 PM

Last Updated: 10/10/2005 08:21 PM

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.

MATERIAL SAFETY DATA SHEET

For R&D use only. Not for drug, household or other uses.

Click http://www.lookchem.com/cas-50/50-32-8.html for suppliers of this product.

Composition/Information on Ingredient

Cas:
50-32-8
Code:
M

RTECS:
DJ8975000
Code:
M

Name:
BENZO (A) PYRENE

Other REC Limits:
N/K

OSHA PEL:
0.2 MG/M3
Code:
M

OSHA STEL:

Code:

ACGIH TLV:
A2, MG/M3:9394
Code:
M

ACGIHSTEL:
N/P
Code:

Control Measures

Respiratory Protection:
USE MSHA/NIOSH APPROVED RESPIRATOR

Ventilation:
GENERAL OR LOCAL EXHAUST TO KEEP
Protective Gloves:
PERMEATION RESISTANT ELASTOMERIC

Eye Protection:
CHEMICAL SPLASH GOGGLES

Other Protective Equipment:
Equipment COVERALLS. LONG-SLEEVED SHIRT, LONG PANTS. ELASTOMERIC BOOTS OR OVERSHOE.

Work Hygienic Practices:
WASH HANDS W/SOAP/WATER AFTER HANDLING &BEFORE EATING/SMOKING. SHOWER AT THE END OF WORK SHIFT.

Supplemental Safety and Health:
BOILING RANGE: 302-995F. OBSERVE MSDS & LABEL PRECAUTION UNTIL CONTAINERS ARE RECONDITIONED.

Health Hazards Data

LD50LC50Mixture:
N/K

Route Of Entry Inds - Inhalation:
YES

Skin:
YES

Ingestion:
YES

Carcinogenicity Inds - NTP:
YES

IARC:
YES

OSHA:
NO

Health Hazards Acute And Chronic:
INHALATION: RESPIRATORY TRACT IRRITATION. EYES: IRRITATION, DAMAGE. SKIN: IRRITATION, DERMATITIS, ACNE, REACTION, BLISTER. INGESTION: GI IRRITATION, NAUSEA, VOMITING & FATAL. 6

Explanation Of Carcinogenicity:
SILICA/COAL TAR/BENZO(A)PYRENE/LIGHTLY TREATD OR UNTREATED MINERAL OILS HAVE BEEN DETERMINED TO BE CARCINOGENS.

Signs And Symptoms Of Overexposure:
INHALATION: IT MAY CAUSE CANCER OF THE LUNG, KIDNEYS OR BLADDER. SKIN: PIGMENTATION, GROWTHS, CANCER. EYES: IRRITATION, DAMAGE. INGESTION: GI IRRITATION, NAUSEA, VOMITING & FATAL.

Medical Cond Aggravated By Exposure:
N/K

First Aid:
INHALATION: REMOVE TO FRESH AIR. GIVE ARTIFICAL RESPIRATION IF BREATHING HAS SPED. ADMINISTER OXYGEN IF BREATHING IS DIFFICULT. EYES: FLUSH W/PLENTY OF WATER FOR 15 MINS. SKIN: CLEAN AREA W/CORN OI L/WATERLESS CLEANER, THEN FOLLOW W/SOAP& WATER. DONT USE SOLVENTS TO CLEAN. USE HYPOCORTISONE CREAM FOR RELIEF. INGESTION: DONT INDUCE VOMITING/GIVE ANYTHING BY MOUTH. OBTAIN MED ATTN IN ALL CASES.

Spill Release Procedures:
VENTILATE AREA & CONTAIN BY DIKING W/SAND EARTH OR OTHER INERT MATERIAL TO PREVENT ENTRY INTO SEWERS OR OPEN BODIES OF WATER. TRANSFER SPILLAGE TO CONTAINERS SUITABLE FOR RECOVERY OR DISPOSAL.

Neutralizing Agent:
N/K

Waste Disposal Methods:
INCINERATE AT A PERMITTED FACILITY IN ACCORDANCE W/LOCAL, STATE & FEDERL REGULATIONS.

Handling And Storage Precautions:
COAL TAR IS A PHOTOTOXIC SUBSTANCE. STORE CONTAINERS SEPERATE FROM OXIDIZERS & IN ACCORDANCE W/ANSI/NFPA 30.

Other Precautions:
EMPTY CONTAINERS MAY CONTAIN HAZARDOUS LIQUID OR SOLID RESIDUES. DONT FLAME-CUT/WELD/PUNCTURE. AVOID SKIN CONTACT. WASH CONTAMINATED CLOTHING BEFORE REUSE. DONT WEAR CONTACT LENSES.

Fire and Explosion Hazard Information

Flash Point Method:
N/P

Flash Point:

Flash Point Text:
180F

Autoignition Temp:

Autoignition Temp Text:
N/A

Lower Limits:
N/K

Upper Limits:
N/K

Extinguishing Media:
DRY CHEMICAL, FOAM, CO2, WATER FOG

Fire Fighting Procedures:
WEAR MSHA/NIOSH APPROVED RESPIRATOR (PRESSURE DEMAND, SCBA) & FULL PROTECTIVE GEAR. COOL EXPOSED CONTAINERS W/WATER SPRAY.

Unusual Fire/Explosion Hazard:
7 ELIMINATE IGNITION SOURCES IF HEATED >180F. IN CLOSED TANKS, WATER/FOAM MAY CAUSE FROTHING/ERUPTION. COMBUSTIBLE LIQUID. AUTOIGNITION TEM: >410F.

Physical/Chemical Properties

HCC:

NRC/State LIC No:

Net Prop WT For Ammo:

Boiling Point:

B.P. Text:
SEE SUP

Melt/Freeze Pt:

M.P/F.P Text:
N/K

Decomp Temp:

Decomp Text:
N/K

Vapor Pres:
2

Vapor Density:
1.0

Volatile Org Content %:

Spec Gravity:
1-1.2

VOC Pounds/Gallon:

PH: N/K

VOC Grams/Liter:

Viscosity:
N/P

Evaporation Rate & Reference:
N/K

Solubility in Water:
NEGLIGIBLE

Appearance and Odor:
BLACK, SEMI-SOLID PASTE, HYDROCARBON ODOR

Percent Volatiles by Volume:
25%

Corrosion Rate:
N/K

Reactivity Data

Stability Indicator:
YES 8

Stability Condition To Avoid:
N/K

Materials To Avoid:
STRONG OXIDIZERS, LIQUID CHLORINE, SODIUM, POTASSIUM HYPOCHLORITE, NITRIC ACID, &PEROXIDES.

Hazardous Decomposition Products:
OXIDES OF NITROGEN, CARBON, &SULFUR

Hazardous Polymerization Indicator:
NO

Conditions To Avoid Polymerization:
N/K

Toxicological Information

Information:N/P

MSDS Transport Information

Information:N/P

Regulatory Information

Sara Title III Information: N/P

Federal Regulatory Information: N/P

State Regulatory Information: N/P

Other Information

Other Information:N/P

LIQUINOX MSDS

Section 1 : PRODUCT AND COMPANY IDENTIFICATION

Chemical family: Detergent.

Manufacturer: Alconox, Inc.
30 Glenn St.
Suite 309
White Plains, NY 10603.

Manufacturer emergency phone number: 800-255-3924.
813-248-0585 (outside of the United States).

Supplier: Same as manufacturer.

Product name: Liquinox

Section 2 : INGREDIENT INFORMATION

C.A.S.	CONCENTRATION %	Ingredient Name	T.L.V.	LD/50	LC/50
25155-30-0	10-30	SODIUM DODECYLBENZENESULFONATE	NOT AVAILABLE	438 MG/KG RAT ORAL 1330 MG/KG MOUSE ORAL	NOT AVAILABLE

Section 3 : HAZARD IDENTIFICATION

Route of entry: Skin contact, eye contact, inhalation and ingestion.

Effects of acute exposure

Eye contact: May cause irritation.

Skin contact: Prolonged and repeated contact may cause irritation.

Inhalation: May cause headache and nausea.

Ingestion: May cause vomiting and diarrhea.
May cause gastric distress.

Effects of chronic exposure: See effects of acute exposure.

Section 4 : FIRST AID MEASURES

Skin contact: Remove contaminated clothing.
Wash thoroughly with soap and water.
Seek medical attention if irritation persists.

Eye contact: Check for and remove contact lenses.
Flush eyes with clear, running water for 15 minutes while holding eyelids open: If irritation persists, consult a physician.

Inhalation: Remove victim to fresh air.
If irritation persists, seek medical attention.

Ingestion: Do not induce vomiting, seek medical attention.
Dilute with two glasses of water.
Never give anything by mouth to an unconscious person.

Section 5 : FIRE FIGHTING MEASURES

Flammability: Not flammable.

Conditions of flammability: Surrounding fire.

Extinguishing media: Carbon dioxide, dry chemical, foam.
Water
Water fog.

Special procedures: Self-contained breathing apparatus required.
Firefighters should wear the usual protective gear.
Use water spray to cool fire exposed containers.

Auto-ignition temperature: Not available.

Flash point (°C), method: None

Lower flammability limit (% vol): Not applicable.

Upper flammability limit (% vol): Not applicable.

Explosion Data

Sensitivity to static discharge: Not available.

Sensitivity to mechanical impact: Not available.

Hazardous combustion products: Oxides of carbon (COx).
Hydrocarbons.

Rate of burning: Not available.

Explosive power: Containers may rupture if exposed to heat or fire.

Section 6 : ACCIDENTAL RELEASE MEASURES

Leak/Spill: Contain the spill.
Prevent entry into drains, sewers, and other waterways.
Wear appropriate protective equipment.
Small amounts may be flushed to sewer with water.
Soak up with an absorbent material.
Place in appropriate container for disposal.
Notify the appropriate authorities as required.

Section 7 : HANDLING AND STORAGE

Handling procedures and equipment: Protect against physical damage.
Avoid breathing vapors/mists.

Wear personal protective equipment appropriate to task.
Wash thoroughly after handling.
Keep out of reach of children.
Avoid contact with skin, eyes and clothing.
Avoid extreme temperatures.
Launder contaminated clothing prior to reuse.

Storage requirements: Store away from incompatible materials.
Keep containers closed when not in use.

Section 8 : EXPOSURE CONTROLS / PERSONAL PROTECTION

Precautionary Measures

Gloves/Type:

Wear appropriate gloves.

Respiratory/Type: None required under normal use.

Eye/Type:

Safety glasses recommended.

Footwear/Type: Safety shoes per local regulations.

Clothing/Type: As required to prevent skin contact.

Other/Type: Eye wash facility should be in close proximity.
Emergency shower should be in close proximity.

Ventilation requirements: Local exhaust at points of emission.

Exposure limit of material: Not available.

Section 9 : PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Liquid.

Appearance & odor: Odourless.
Pale yellow.

Odor threshold (ppm): Not available.

Vapour pressure (mmHg): @ 20°C (68°F).
17

Vapour density (air=1): >1

Volatiles (%)

By volume: Not available.

Evaporation rate (butyl acetate = 1): < 1.

Boiling point (°C): 100 (212F)

Freezing point (°C): Not available.

pH: 8.5

Specific gravity @ 20 °C: (water = 1).
1.083

Solubility in water (%): Complete.

Coefficient of water\oil dist.: Not available.

VOC: None

Chemical family: Detergent.

Section 10 : STABILITY AND REACTIVITY

Chemical stability: Product is stable under normal handling and storage conditions.

Conditions of instability: Extreme temperatures.

Hazardous polymerization: Will not occur.

Incompatible substances: Strong acids.
Strong oxidizing agents.

Hazardous decomposition products: See hazardous combustion products.

Section 11 : TOXICOLOGICAL INFORMATION

LD50 of product, species & route: > 5000 mg/kg rat oral.

LC50 of product, species & route: Not available.

Sensitization to product: Not available.

Carcinogenic effects: Not listed as a carcinogen.

Reproductive effects: Not available.

Teratogenicity: Not available.

Mutagenicity: Not available.

Synergistic materials: Not available.

Section 12 : ECOLOGICAL INFORMATION

Environmental toxicity: No data at this time.

Environmental fate: No data at this time.

Section 13 : DISPOSAL CONSIDERATIONS

Waste disposal: In accordance with local and federal regulations.

Section 14 : TRANSPORT INFORMATION

D.O.T. CLASSIFICATION: Not regulated.

Special shipping information: Not regulated.

Section 15 : REGULATORY INFORMATION

Canadian Regulatory Information

WHMIS classification: Not controlled.

DSL status: Not available.

USA Regulatory Information

SARA hazard catagories sections 311/312: Immediate (Acute) Health Hazard: No.
Delayed (Chronic) Health Hazard: No.
Fire Hazard: No.
Sudden Release of Pressure: No.
Reactive: No.

SARA Section 313: None

TSCA inventory: All components of this product are listed on the TSCA Inventory.

NFPA

Health Hazard: 1

Flammability: 0

Physical hazard: 0

Section 16 : OTHER INFORMATION

Supplier MSDS date: 2005/02/24

Data prepared by: Global Safety Management
3340 Peachtree Road, #1800
Atlanta, GA 30326

Phone: 877-683-7460
Fax: (877) 683-7462

Web: www.globalsafetynet.com
Email: info@globalsafetynet.com.

General note: This material safety data sheet was prepared from information obtained from various sources, including product suppliers and the Canadian Center for Occupational Health and Safety.

ExxonMobil
Lubricants and Petroleum Specialties

DATE ISSUED: 08/10/99
SUPERSEDES DATE: 03/22/99

MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

COMPANY: Exxon Mobil Corporation
ExxonMobil Lubricants & Petroleum
Specialties Company
3225 Gallows Road
Fairfax, VA 22037-0001

PRODUCT NAME
EXXON DYED LOW S D2x

PRODUCT CODE
072719 - 00707

PRODUCT CATEGORY
Petroleum Distillate Fuel

MEDICAL EMERGENCY TELEPHONE NUMBER: (713) 656-3424

TRANSPORTATION EMERGENCY TELEPHONE NUMBERS
(BAYTOWN) (281) 834-3296 (CHEMTREC) 1-800-424-9300

Product Information and Technical Assistance: 1-800-443-9966

FAXED MSDSs: 1-800-298-4007 MAILED MSDSs OR OTHER ASSISTANCE: (713) 656-5949

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Fuels, diesel, No. 2	68476-34-6	100%

Contains red dye to meet the IRS requirements for tax-exempt diesel fuel. No data are available on potential detrimental effects of the dye on product performance; ExxonMobil therefore assumes no responsibility for such effects.

SEE SECTION 8 FOR EXPOSURE LIMITS

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

OSHA REQUIRED LABEL INFORMATION
In compliance with hazard and right-to-know requirements, where applicable OSHA Hazard Warnings may be found on the label, bill of lading or invoice

accompanying this shipment.

DANGER!
COMBUSTIBLE
LONG-TERM, REPEATED EXPOSURE MAY
CAUSE SKIN CANCER

Note: Product label may contain non-OSHA related information also.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	2	0	Recommended by ExxonMobil

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
0	2	0	Recommended by the National Fire Protection Association

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)

Prolonged or repeated liquid contact with the skin will dry and defat the skin, leading to possible irritation and dermatitis.
High vapor concentrations (greater than approximately 1000 ppm, attainable at temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

SECTION 4: FIRST AID MEASURES

EYE CONTACT

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN

In case of skin contact, remove any contaminated clothing and wash skin with soap and water. Launder or dry-clean clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION

Overexposure may cause gasping, nausea and disorientation.

Vapor pressure is very low. Vapor inhalation under ambient conditions is

normally not a problem. If overcome by vapor from hot product, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

SECTION 5: FIRE-FIGHTING MEASURES

FLASH POINT (MINIMUM)
COMBUSTIBLE - Per DOT 49 CFR 173.115
52~C (125~F)
ASTM D 93, Pensky Martens Closed Cup

AUTOIGNITION TEMPERATURE
Greater than 204~C (400~F)

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 0.9% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Tenth Edition (1991):

Use dry chemical, foam or carbon dioxide to extinguish the fire. "Water may be ineffective", but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

SECTION 6: ACCIDENTAL RELEASE MEASURES

CLEAN WATER ACT / OIL POLLUTION ACT
This product may be classified as an oil under Section 311 of the Clean Water Act, and under the Oil Pollution Act. Discharges or spills into or leading to surface waters that cause a sheen must be reported to the National Response Center (1-800-424-8802).

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.

Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, combustible vapors from absorbed material.

SECTION 7: STORAGE AND HANDLING

HANDLING PRECAUTIONS
This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

Do not attempt to refill or clean containers since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
100 ppm (900 mg/m3) for an 8-hour workday	Recommended by ExxonMobil

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
To prevent fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system in accordance with (THE) National Fire Protection Association PUBLICATIONS.

To minimize fire or explosion risk from static charge accumulation and discharge, effectively bond and/or ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor, mist or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean before re-use; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
160-350-C (320-650-F)

SPECIFIC GRAVITY (15.6 Deg C/15.6 Deg C)
0.86

MOLECULAR WEIGHT
Approximately 212 average

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT

VAPOR PRESSURE
Less than 1 mm Hg @ 20-C

VAPOR DENSITY (AIR = 1)
Greater than 5

PERCENT VOLATILE BY VOLUME
100

EVAPORATION RATE @ 1 ATM. & 25 Deg C (77 Deg F) (n-BUTYL ACETATE = 1)
0.02

SOLUBILITY IN WATER @ 1 ATM. AND 25 Deg C (77 Deg F)

-18 Deg C (0 Deg F)
Pour Point by ASTM D 97

Negligible; less than 0.1%

VISCOSITY
1.9 to 4.1 cSt @ 40~C

PRODUCT APPEARANCE AND ODOR
Clear liquid, contains red dye
Faint petroleum hydrocarbon odor

SECTION 10: STABILITY AND REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

SECTION 11: TOXICOLOGICAL INFORMATION

NATURE OF HAZARD AND TOXICITY INFORMATION
This product contains ethylbenzene. A study conducted by the National Toxicology Program states that lifetime inhalation exposure of rats and mice to high concentrations of ethylbenzene (750 ppm) resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations of ethylbenzene (75 ppm or 250 ppm). The study does not address the relevance of these results to humans.

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Lifetime skin painting studies conducted by the American Petroleum Institute, ExxonMobil and others have shown that similar products boiling between 175-370 Deg C (350-700 Deg F) usually produce skin tumors and/or skin cancer in laboratory mice. The degree of carcinogenic response was weak to moderate with a relatively long latent period. The implications of these results for humans have not been determined.

Limited studies on oils that are very active carcinogens have shown that washing the animals' skin with soap and water between applications greatly reduces tumor formation. These studies demonstrate the effectiveness of cleansing the skin after contact.

Potential risks to humans can be minimized by observing good work practices and personal hygiene procedures generally recommended for petroleum products. See Section 8 for recommended protection and precautions.

Contains light hydrocarbon components. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The U.S. EPA Risk Assessment Forum has concluded that the male rat kidney tumor results

are not relevant for humans. Total gasoline exposure also produced liver tumors in female mice only. The implication of these data for humans has not been determined. Certain components, such as normal hexane, may also affect the nervous system at high concentrations (e.g., 1000-1500 ppm).

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Inhalation of components of exhaust from burning, such as carbon monoxide, may cause death at high concentrations.

Long-term repeated exposure of laboratory animals to whole diesel exhaust has resulted in an increased incidence of lung cancer.

Exposure to exhaust from burning and diesel exhaust should be minimized.

SECTION 12: ECOLOGICAL INFORMATION

Do not discharge this product into public waters or waterways unless authorized by a National Pollution Discharge Elimination System (NPDES) permit issued by the Environmental Protection Agency (EPA).

Environmental and Ecological data may be available for this product. Write or call ExxonMobil to obtain further information. Refer to Section 6 and Section 15 for Accidental Release information and Regulatory Reporting information.

SECTION 13: DISPOSAL CONSIDERATION

Options for disposal of this product may depend on the conditions under which it was used. To determine the proper method of disposal, refer to RCRA (40 CFR 261), as well as federal EPA and state and local regulations.

Please refer to Sections 5, 6 and 15 for additional information.

SECTION 14: TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents.

U.S. DOT HAZARDOUS MATERIALS SHIPPING DESCRIPTION
Transported by highway or rail:

Bulk packagings (capacity greater than 119 gallons)
Fuel Oil, Combustible Liquid, NA 1993, III

Non-bulk packagings (capacity less than or equal to 119 gallons)
Not regulated

Transported by air or marine vessel:

Bulk or non-bulk packagings
Gas Oil, 3, UN 1202, III

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355
(SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
No toxic chemical is present greater than 1% or 0.1% (carcinogen).

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)
EPA Hazard Classification Codes: Chronic, Fire

TOXIC SUBSTANCES CONTROL ACT (TSCA)
This product may contain the following TSCA 12b reportable chemical substance(s):
2-Ethylhexanol CAS # 104-76-7

This product, as manufactured by ExxonMobil, does not contain polychlorinated biphenyls (PCB's).

All components of this product are listed on the U.S. TSCA inventory.

SECTION 16: OTHER INFORMATION

The health and safety information presented herein must be used in conjunction with the pertinent standards for training, work practices and facilities design established by OSHA, NIOSH, NFPA, API, NEC, NSC, UNDERWRITERS, BUREAU OF MINES, and similar organizations.

The information and recommendations contained herein are, to the best of ExxonMobil's knowledge and belief, accurate and reliable as of the date issued. ExxonMobil does not warrant or guarantee their accuracy or reliability, and ExxonMobil shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use. If buyer repackages this product, legal counsel should be consulted to insure proper health, safety and other necessary information is included on the container.

The Environmental Information included under Section 15 hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by ExxonMobil Lubricants & Petroleum Specialties Company, in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with ExxonMobil's interpretation of the available data.

ExxonMobil
Lubricants and Petroleum Specialties

DATE ISSUED: 03/15/00
SUPERSEDES DATE: 08/10/99

MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

COMPANY: Exxon Mobil Corporation
ExxonMobil Lubricants & Petroleum
Specialties Company
3225 Gallows Road
Fairfax, VA 22037-0001

PRODUCT NAME
EXXON SUPREME UNLEADED RFG

PRODUCT CODE
000007 - 62100

This Material Safety Data Sheet is valid for all EXXON UNLEADED SUPREME and UNLEADED PREMIUM Reformulated Gasolines and CARB Phase II Gasolines.

PRODUCT CATEGORY
Reformulated Motor Gasoline - Certified under Complex Model Standards
Contains minimum 1.5 weight % oxygen

MEDICAL EMERGENCY TELEPHONE NUMBER: (713) 656-3424

TRANSPORTATION EMERGENCY TELEPHONE NUMBERS
(BAYTOWN) (281) 834-3296 (CHEMTREC) 1-800-424-9300

Product Information and Technical Assistance: 1-800-443-9966

FAXED MSDSs: 1-800-298-4007 MAILED MSDSs OR OTHER ASSISTANCE: (713) 656-5949

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
Product is a variable complex mixture of components, principally hydrocarbons, blended to performance, rather than chemical specifications and typically contains the following:		
Naphtha (petroleum), light catalytic cracked	64741-55-5	
Naphtha (petroleum), heavy catalytic cracked	64741-54-4	
Naphtha (petroleum), full-range reformed	68919-37-9	
Naphtha (petroleum), full-range alkylate	64741-64-6	
Naphtha (petroleum), sweetened	64741-87-3	

Butane	106-97-8	
Proprietary additives	Proprietary	

It may include varying amounts of the following identifiable components:

Benzene	71-43-2	0-1.3%
Cumene	98-82-8	0-1%
Cyclohexane	110-82-7	0-1%
Ethylbenzene	100-41-4	0-3%
Naphthalene	91-20-3	0-1%
n-Hexane	110-54-3	0-3%
Toluene	108-88-3	0-20%
Xylene	1330-20-7	0-10%
1,2,4-Trimethylbenzene	95-63-6	0-2%

It may also include varying amounts of oxygenates such as the following:

Di-isopropyl ether	108-20-3	0-18%
Ethanol	64-17-5	0-10%
Ethyl-tertiary-butyl ether	637-92-3	0-18.5%
Methyl-tertiary-butyl ether	1634-04-4	0-16%
Tertiary-amyl-methyl-ether	994-05-8	0-18.5%

SEE SECTION 8 FOR EXPOSURE LIMITS

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

OSHA REQUIRED LABEL INFORMATION

In compliance with hazard and right-to-know requirements, where applicable OSHA Hazard Warnings may be found on the label, bill of lading or invoice accompanying this shipment.

DANGER!
EXTREMELY FLAMMABLE
LONG-TERM, REPEATED EXPOSURE MAY CAUSE
CANCER, BLOOD AND NERVOUS SYSTEM DAMAGE

CONTAINS: BENZENE

Note: Product label may contain non-OSHA related information also.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by ExxonMobil

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by the National Fire Protection Association

VARIABILITY AMONG INDIVIDUALS

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
Prolonged or repeated liquid contact with the skin will dry and defat the skin, leading to possible irritation and dermatitis.
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Benzene - Individuals with liver disease may be more susceptible to toxic effects.

Hexane - Individuals with neurological disease should avoid exposure.

Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

SECTION 4: FIRST AID MEASURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin with soap and water. Launder or dry-clean clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though intial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

SECTION 5: FIRE-FIGHTING MEASURES

UNUSUAL FIRE AND EXPLOSION HAZARD

EXTREMELY FLAMMABLE VAPORS CAN TRAVEL AND EXPLODE

FLASH POINT (MINIMUM)
FLAMMABLE - Per DOT 49 CFR 173.120
Approximately -38°C (-36°F)

AUTOIGNITION TEMPERATURE

Approximately 456°C (853°F)
National Fire Protection Association's Guide on Hazardous Materials

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 1.4% Upper Flammable Limit 7.6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Tenth Edition (1991):

Use dry chemical, foam or carbon dioxide to extinguish the fire. "Water may be ineffective", but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect persons attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing of gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, sulfur oxides, aldehydes and other decomposition products, in the case of incomplete combustion.

SECTION 6: ACCIDENTAL RELEASE MEASURES

CLEAN WATER ACT / OIL POLLUTION ACT
This product may be classified as an oil under Section 311 of the Clean Water Act, and under the Oil Pollution Act. Discharges or spills into or leading to surface waters that cause a sheen must be reported to the National Response Center (1-800-424-8802).

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.

Assure conformity with applicable governmental regulations. Continue to observe precautions for volatile, flammable vapors from absorbed material.

SECTION 7: STORAGE AND HANDLING

HANDLING PRECAUTIONS
This liquid is volatile and gives off invisible vapors. Either the liquid or

vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

Keep product away from ignition sources, such as heat, sparks, pilot lights, static electricity, and open flames.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

Do not attempt to refill or clean containers since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
100 ppm (300 mg/m3) for an 8-hour workday	Recommended by ExxonMobil. OSHA Regulation 29 CFR 1910.1000 and the American Conference of Governmental Industrial Hygienists (ACGIH) list Threshold Limit Values (TLV) of 300 ppm (900 mg/m3) for gasoline for an 8-hour workday; 500 ppm (1500 mg/m3) STEL.
50 ppm (180 mg/m3) for n-hexane for an 8-hour workday	OSHA Regulation 29 CFR 1910.1000 and recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)
50 ppm (187 mg/m3) for toluene (skin) for an 8-hour workday	Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)
25 ppm (90 mg/m3) for methyl-tertiary-butyl ether for an 8-hour workday	Recommended by ExxonMobil
75 ppm (270 mg/m3) for methyl-tertiary-butyl ether for a 15 minute STEL	Recommended by ExxonMobil
The airborne benzene level shall not exceed 1 ppm for an 8-hour workday; 5 ppm STEL	OSHA Regulation 29 CFR 1910.1028

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. No smoking, or

use of flame or other ignition sources.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing, which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
To prevent fire or explosion risk from static accumulation and discharge, effectively bond and/or ground product transfer system in accordance with (THE) National Fire Protection Association PUBLICATIONS.

Keep containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. Adequate ventilation required sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Tanks that have been in leaded gasoline service may have lead-containing residue. Special precautions needed in cleaning. See American Petroleum Institute publications 2013, 2015 and 2015A. No smoking, flame or other ignition sources.

To minimize fire or explosion risk from static charge accumulation and discharge, effectively bond and/or ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices, etc.) in or around any fueling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by the national and/or local laws/regulations.

For use as a motor fuel only. Do not use as a cleaning solvent, or thinner, or for other non-motor fuel uses. Do not siphon by mouth. Minute amounts of liquid gasoline aspirated into the lungs may cause potentially fatal chemical pneumonitis.

In order to prevent fire or explosion hazards, use appropriate equipment.

Information on electrical equipment appropriate for use with this product may be found in the latest edition of the National Electrical Code (NFPA-70). This document is available from the National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before re-use. Remove contaminated shoes and thoroughly clean and dry before re-use. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners

followed by washing thoroughly with soap and water.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Approximately 21~C (70~F) IBP
to 225~C (437~F) FBP

SPECIFIC GRAVITY (15.6 Deg C/15.6 Deg C)
Approximately 0.74

MOLECULAR WEIGHT
Complex mixture, components vary
from approximately 45 to 185

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -30~C (-36~F)
Pour Point by ASTM D 97

VISCOSITY
Approximately 0.5 cSt @ 25~C

PRODUCT APPEARANCE AND ODOR
Clear colored liquid (typically orange)
Gasoline hydrocarbon odor

VAPOR PRESSURE
Varies seasonally from
approximately 5 to 15 psi
Reid Vapor Pressure

VAPOR DENSITY (AIR = 1)
Approximately 5

PERCENT VOLATILE BY VOLUME
100

EVAPORATION RATE @ 1 ATM. & 25 Deg C
(77 Deg F) (n-BUTYL ACETATE = 1)
Approximately 10-11

SOLUBILITY IN WATER @ 1 ATM.
AND 25 Deg C (77 Deg F)
Negligible; less than 0.1%

SECTION 10: STABILITY AND REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite, calcium hypochlorite, etc., as this presents a serious explosion hazard.

SECTION 11: TOXICOLOGICAL INFORMATION

NATURE OF HAZARD AND TOXICITY INFORMATION
WARNING: Concentrated, prolonged or deliberate inhalation of this product may cause brain and nervous system damage. Prolonged and repeated exposure of pregnant animals to high levels of toluene (levels greater than approximately 1500 ppm) has been reported to cause adverse fetal developmental effects.

This product contains ethylbenzene. A study conducted by the National Toxicology Program states that lifetime inhalation exposure of rats and mice to high concentrations of ethylbenzene (750 ppm) resulted in increases in certain types of cancer, including kidney tumors in rats and lung and liver tumors in mice. These effects were not observed in animals exposed to lower concentrations of ethylbenzene (75 ppm or 250 ppm). The study does not address the relevance of these results to humans.

Prolonged or repeated skin contact with this product tends to remove skin oils, possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

This product may contain up to a maximum of 1.3 weight percent benzene, CAS # 71-43-2, as a natural constituent of various gasoline blend components. Benzene can cause anemia and other blood diseases, including leukemia (cancer of the blood-forming system), after prolonged or repeated exposures at high concentrations (e.g., 50-500 ppm). It has also caused fetal defects in tests on laboratory animals.

Contains light hydrocarbon components. Lifetime studies by the American Petroleum Institute have shown that kidney damage and kidney cancer can occur in male rats after prolonged inhalation exposures at elevated concentrations of total gasoline. Kidneys of mice and female rats were unaffected. The U.S. EPA Risk Assessment Forum has concluded that the male rat kidney tumor results are not relevant for humans. Total gasoline exposure also produced liver tumors in female mice only. The implication of these data for humans has not been determined. Certain components, such as normal hexane, may also affect the nervous system at high concentrations (e.g., 1000-1500 ppm).

The presence of n-hexane (normal-hexane) in this product represents a distinct hazard of producing peripheral polyneuropathy, a progressive disorder of the nervous system, which with sufficient high exposure has the potential of becoming irreversible. This disorder has been observed in individuals exposed repeatedly to high vapor concentrations (1000-1500 ppm) of n-hexane over a period of several months. Exposure to this product should be controlled to keep the maximum level below 100 ppm, which will result in n-hexane exposure of 50 ppm or less. The OSHA 8-hour Time Weighted Average-Permissible Exposure Limit (TWA-PEL) is 50 ppm for n-hexane.

Simultaneous exposure to the vapors of n-hexane and methyl ethyl ketone (MEK) or to n-hexane and methyl isobutyl ketone (MIBK) increases the risk of adverse effects from n-hexane. Evidence in laboratory animals and humans indicates that in the presence of MEK or MIBK the neuropathy associated with n-hexane is produced in a shorter time or at lower exposure concentrations. This interaction has not been reported when the exposure to n-hexane is below the American Conference of Governmental Industrial Hygienists (ACGIH) limit of 50 ppm and MEK is below the ACGIH limit of 200 ppm or when MIBK is below the ACGIH limit of 50 ppm.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Inhalation of components of exhaust from burning, such as carbon monoxide, may cause death at high concentrations. Exposure to the exhaust of this fuel should be minimized.

Methyl Tertiary Butyl Ether (MTBE) was tested for carcinogenicity, neurotoxicity, chronic, reproductive and developmental toxicity. The NOEL for all endpoints evaluated in three animal species was 400 ppm or greater. An increase in kidney tumors/damage and liver tumors was observed in animals exposed to high concentrations of MTBE. Some embryo/fetal toxicity and birth defects were observed in the offspring of pregnant mice exposed to maternally toxic doses of MTBE, however the offspring of exposed pregnant rabbits were unaffected. The significance of the animal findings at high exposures are not believed to be directly related to potential human health hazards in the workplace.

SECTION 12: ECOLOGICAL INFORMATION

Do not discharge this product into public waters or waterways unless authorized by a National Pollution Discharge Elimination System (NPDES) permit issued by the Environmental Protection Agency (EPA).

Environmental and Ecological data may be available for this product. Write or call ExxonMobil to obtain further information. Refer to Section 6 and Section 15 for Accidental Release information and Regulatory Reporting information.

SECTION 13: DISPOSAL CONSIDERATION

Options for disposal of this product may depend on the conditions under which it was used. To determine the proper method of disposal, refer to RCRA (40 CFR 261), as well as federal EPA and state and local regulations.

Please refer to Sections 5, 6 and 15 for additional information.

SECTION 14: TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents.

U.S. DOT HAZARDOUS MATERIALS SHIPPING DESCRIPTION
Gasoline, 3, UN 1203, II

SECTION 15: REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

THE FOLLOWING INFORMATION MAY BE USEFUL IN COMPLYING WITH VARIOUS STATE AND FEDERAL LAWS AND REGULATIONS UNDER VARIOUS ENVIRONMENTAL STATUTES:

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355
(SARA Sections 301-304)
No TPQ for product or any constituent greater than 1% or 0.1% (carcinogen).

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372 (SARA Section 313)
This product may contain:
Up to 1.3% benzene.
Up to 1% cumene.
Up to 1% cyclohexane.
Up to 3% ethylbenzene.
Up to 16% methyl-tertiary-butyl ether.
Up to 1% naphthalene.
Up to 3% n-hexane.
Up to 20% toluene.
Up to 10% xylene.
Up to 2% 1,2,4-Trimethylbenzene

HAZARDOUS CHEMICAL REPORTING, EPA REGULATION 40 CFR 370 (SARA Sections 311-312)
EPA Hazard Classification Codes: Acute, Chronic, Fire

TOXIC SUBSTANCES CONTROL ACT (TSCA)
This product may contain the following TSCA 12b reportable chemical substance(s):
Isopropanol (IPA) CAS # 67-63-0
Methyl-tertiary-butyl ether (MTBE) CAS # 1634-04-4
Tertiary-amyl-methyl-ether (TAME) CAS # 994-05-8

This product, as manufactured by ExxonMobil, does not contain polychlorinated biphenyls (PCB's).

All components of this product are listed on the U.S. TSCA inventory.

SECTION 16: OTHER INFORMATION

The health and safety information presented herein must be used in conjunction with the pertinent standards for training, work practices and facilities design established by OSHA, NIOSH, NFPA, API, NEC, NSC, UNDERWRITERS, BUREAU OF MINES, and similar organizations.

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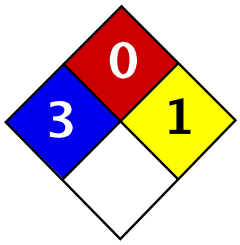

Health	3
Fire	0
Reactivity	1
Personal Protection	

Material Safety Data Sheet
Hydrochloric acid MSDS

Section 1: Chemical Product and Company Identification

Product Name: Hydrochloric acid

Catalog Codes: SLH1462, SLH3154

CAS#: Mixture.

RTECS: MW4025000

TSCA: TSCA 8(b) inventory: Hydrochloric acid

CI#: Not applicable.

Synonym: Hydrochloric Acid; Muriatic Acid

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Hydrogen chloride	7647-01-0	20-38
Water	7732-18-5	62-80

Toxicological Data on Ingredients: Hydrogen chloride: GAS (LC50): Acute: 4701 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Non-corrosive for lungs. Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
Slightly hazardous in case of skin contact (sensitizer).
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid].
MUTAGENIC EFFECTS: Not available.

TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to kidneys, liver, mucous membranes, upper respiratory tract, skin, eyes, Circulatory System, teeth.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of metals

Explosion Hazards in Presence of Various Substances: Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Non combustible.
Calcium carbide reacts with hydrogen chloride gas with incandescence.
Uranium phosphide reacts with hydrochloric acid to release spontaneously flammable phosphine.
Rubidium acetylene carbides burns with slightly warm hydrochloric acid.
Lithium silicide in contact with hydrogen chloride becomes incandescent. When dilute hydrochloric acid is used, gas spontaneously flammable in air is evolved.
Magnesium boride treated with concentrated hydrochloric acid produces spontaneously flammble gas.
Cesium acetylene carbide burns hydrogen chloride gas.
Cesium carbide ignites in contact with hydrochloric acid unless acid is dilute.
Reacts with most metals to produce flammable Hydrodgen gas.

Special Remarks on Explosion Hazards:
Hydrogen chloride in contact with the following can cause an explosion, ignition on contact, or other violent/vigorous reaction: Acetic anhydride AgClO + CCl4 Alcohols + hydrogen cyanide, Aluminum Aluminum-titanium alloys (with HCl vapor), 2-Amino ethanol, Ammonium hydroxide, Calcium carbide Ca3P2 Chlorine + dinitroanilines (evolves gas), Chlorosulfonic acid Cesium carbide Cesium acetylene carbide, 1,1-Difluoroethylene Ethylene diamine Ethylene imine, Fluorine, HClO4 Hexalithium disilicide H2SO4 Metal acetylides or carbides, Magnesium boride, Mercuric sulfate, Oleum, Potassium permanganate, beta-Propiolactone Propylene oxide Rubidium carbide, Rubidium, acetylene carbide Sodium (with aqueous HCl), Sodium hydroxide Sodium tetraselenium, Sulfonic acid, Tetraselenium tetranitride, U3P4 , Vinyl acetate.
Silver perchlorate with carbon tetrachloride in the presence of hydrochloric acid produces trichloromethyl perchlorate which detonates at 40 deg. C.

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Poisonous liquid.
Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, metals, alkalis, moisture.
May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
CEIL: 5 (ppm) from OSHA (PEL) [United States]
CEIL: 7 (mg/m3) from OSHA (PEL) [United States]
CEIL: 5 from NIOSH
CEIL: 7 (mg/m3) from NIOSH
TWA: 1 STEL: 5 (ppm) [United Kingdom (UK)]
TWA: 2 STEL: 8 (mg/m3) [United Kingdom (UK)]Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Pungent. Irritating (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point:
108.58 C @ 760 mm Hg (for 20.22% HCl in water)
83 C @ 760 mm Hg (for 31% HCl in water)
50.5 C (for 37% HCl in water)

Melting Point:
-62.25°C (-80°F) (20.69% HCl in water)
-46.2 C (31.24% HCl in water)
-25.4 C (39.17% HCl in water)

Critical Temperature: Not available.

Specific Gravity:
1.1- 1.19 (Water = 1)
1.10 (20%and 22% HCl solutions)
1.12 (24% HCl solution)
1.15 (29.57% HCl solution)
1.16 (32% HCl solution)
1.19 (37% and 38%HCl solutions)

Vapor Pressure: 16 kPa (@ 20°C) average

Vapor Density: 1.267 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.25 to 10 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility: Soluble in cold water, hot water, diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials, water

Incompatibility with various substances:
Highly reactive with metals.
Reactive with oxidizing agents, organic materials, alkalis, water.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of stainless steel(304), of stainless steel(316).
Non-corrosive in presence of glass.

Special Remarks on Reactivity:
Reacts with water especially when water is added to the product.
Absorption of gaseous hydrogen chloride on mercuric sulfate becomes violent @ 125 deg. C.
Sodium reacts very violently with gaseous hydrogen chloride.
Calcium phosphide and hydrochloric acid undergo very energetic reaction.
It reacts with oxidizers releasing chlorine gas.
Incompatible with, alkali metals, carbides, borides, metal oxides, vinyl acetate, acetylides, sulphides, phosphides, cyanides, carbonates.
Reacts with most metals to produce flammable Hydrogen gas.
Reacts violently (moderate reaction with heat of evolution) with water especially when water is added to the product. Isolate hydrogen chloride from heat, direct sunlight, alkalies (reacts vigorously), organic materials, and oxidizers (especially nitric acid and chlorates), amines, metals, copper and alloys (e.g. brass), hydroxides, zinc (galvanized materials), lithium silicide (incandescence), sulfuric acid(increase in temperature and pressure)
Hydrogen chloride gas is emitted when this product is in contact with sulfuric acid.
Adsorption of Hydrochloric Acid onto silicon dioxide results in exothmeric reaction.
Hydrogen chloride causes aldehydes and epoxides to violently polymerize.
Hydrogen chloride or Hydrochloric Acid in contact with the folloiwng can cause explosion or ignition on contact or

Special Remarks on Corrosivity:
Highly corrosive. Incompatible with copper and copper alloys. It attacks nearly all metals (mercury, gold, platinium, tantalum, silver, and certain alloys are exceptions).
It is one of the most corrosive of the nonoxidizing acids in contact with copper alloys.
No corrosivity data on zinc, steel.
Severe Corrosive effect on brass and bronze

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation.

Toxicity to Animals:
Acute oral toxicity (LD50): 900 mg/kg [Rabbit].
Acute toxicity of the vapor (LC50): 1108 ppm, 1 hours [Mouse].
Acute toxicity of the vapor (LC50): 3124 ppm, 1 hours [Rat].

Chronic Effects on Humans:
CARCINOGENIC EFFECTS: Classified 3 (Not classifiable for human.) by IARC [Hydrochloric acid].
May cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin,

eyes, Circulatory System, teeth.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of ingestion, .
Hazardous in case of eye contact (corrosive), of inhalation (lung corrosive).

Special Remarks on Toxicity to Animals:
Lowest Published Lethal Doses (LDL/LCL)
LDL [Man] -Route: Oral; 2857 ug/kg
LCL [Human] - Route: Inhalation; Dose: 1300 ppm/30M
LCL [Rabbit] - Route: Inhalation; Dose: 4413 ppm/30M

Special Remarks on Chronic Effects on Humans:
May cause adverse reproductive effects (fetoxicity).
May affect genetic material.

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Corrosive. Causes severe skin irritation and burns.
Eyes: Corrosive. Causes severe eye irritation/conjuntivitis, burns, corneal necrosis.
Inhalation: May be fatal if inhaled. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract. Inhalation of hydrochloric acid fumes produces nose, throat, and larryngeal burning, and irritation, pain and inflammation, coughing, sneezing, choking sensation, hoarseness, laryngeal spasms, upper respiratory tract edema, chest pains, as well has headache, and palpitations. Inhalation of high concentrations can result in corrosive burns, necrosis of bronchial epithelium, constriction of the larynx and bronchi, nasospetal perforation, glottal closure,
occur, particularly if exposure is prolonged. May affect the liver.
Ingestion: May be fatal if swallowed. Causes irritation and burning, ulceration, or perforation of the gastrointestinal tract and resultant peritonitis, gastric hemorrhage and infection. Can also cause nausea, vomitting (with "coffee ground" emesis), diarrhea, thirst, difficulty swallowing, salivation, chills, fever, uneasiness, shock, strictures and stenosis (esophogeal, gastric, pyloric). May affect behavior (excitement), the cardiovascular system (weak rapid pulse, tachycardia), respiration (shallow respiration), and urinary system (kidneys- renal failure, nephritis).
Acute exposure via inhalation or ingestion can also cause erosion of tooth enamel.
Chronic Potential Health Effects:
dyspnea, bronchitis. Chemical pneumonitis and pulmonary edema can also

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Hydrochloric acid, solution UNNA: 1789 PG: II

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:
Connecticut hazardous material survey.: Hydrochloric acid
Illinois toxic substances disclosure to employee act: Hydrochloric acid
Illinois chemical safety act: Hydrochloric acid
New York release reporting list: Hydrochloric acid
Rhode Island RTK hazardous substances: Hydrochloric acid
Pennsylvania RTK: Hydrochloric acid
Minnesota: Hydrochloric acid
Massachusetts RTK: Hydrochloric acid
Massachusetts spill list: Hydrochloric acid
New Jersey: Hydrochloric acid
New Jersey spill list: Hydrochloric acid
Louisiana RTK reporting list: Hydrochloric acid
Louisiana spill reporting: Hydrochloric acid
California Director's List of Hazardous Substances: Hydrochloric acid
TSCA 8(b) inventory: Hydrochloric acid
TSCA 4(a) proposed test rules: Hydrochloric acid
SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid
SARA 313 toxic chemical notification and release reporting: Hydrochloric acid
CERCLA: Hazardous substances.: Hydrochloric acid: 5000 lbs. (2268 kg)

Other Regulations:
OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

DSCL (EEC):
R34- Causes burns.
R37- Irritating to respiratory system.
S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 1

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 1

Specific hazard:

Protective Equipment:
Gloves.
Full suit.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Face shield.

Section 16: Other Information

References:
-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987.
-SAX, N.I. Dangerous Properties of Indutrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984.
-The Sigma-Aldrich Library of Chemical Safety Data, Edition II.
-Guide de la loi et du règlement sur le transport des marchandises dangeureuses au canada. Centre de conformité internatinal Ltée. 1986.

Other Special Considerations: Not available.

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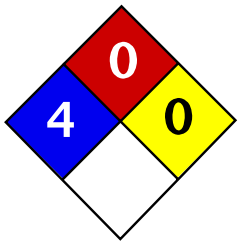

Material Safety Data Sheet
Nitric acid, 70% MSDS

Section 1: Chemical Product and Company Identification

Product Name: Nitric acid, 70%

Catalog Codes: SLN1963, SLN1549

CAS#: Mixture.

RTECS: Not applicable.

TSCA: TSCA 8(b) inventory: Water; Nitric acid, fuming

CI#: Not applicable.

Synonym: Nitric Acid, 70%

Chemical Name: Not applicable.

Chemical Formula: Not applicable.

Contact Information:

Sciencelab.com, Inc.
14025 Smith Rd.
Houston, Texas 77396

US Sales: **1-800-901-7247**
International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:
1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Water	7732-18-5	30
Nitric acid, fuming	7697-37-2	70

Toxicological Data on Ingredients: Nitric acid, fuming: VAPOR (LC50): Acute: 244 ppm 0.5 hours [Rat]. 344 ppm 0.5 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (irritant, corrosive), of ingestion, . Slightly hazardous in case of inhalation (lung sensitizer). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Prolonged exposure may result in skin burns and ulcerations. Over-exposure by inhalation may cause respiratory irritation. Severe over-exposure can result in death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.

MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to lungs, mucous membranes, upper respiratory tract, skin, eyes, teeth.
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Section 4: First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used.Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: of combustible materials

Explosion Hazards in Presence of Various Substances:
Explosive in presence of reducing materials, of metals, of alkalis.
Slightly explosive in presence of combustible materials.
Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards:
Flammable in presence of cellulose or other combustible materials.
Phosphine, hydrogen sulfide, selenide all ignite when fuming nitric acid is dripped into gas.
Phosphine ignites in concentrated nitric acid.
Nickel tetraphosphide ignites with fuming nitric acid.
Contact with metals may evolve flammable hydrogen gas.
A jet of ammonia will ignite nitric acid vapor.
Cellulose may be converted to the highly flammable nitrate ester on contact with the vapor of nitric acid as well as the liquid itself.

Special Remarks on Explosion Hazards:
Reacts exlposively with metallic powders, carbides, cyanides, sulfides, alkalies and turpentine.
Can react explosively with many reducing agents.
Arsine, phosphine, tetraborane all oxidized explosively in presence of nitric acid.
Cesium and rubidium acetylides explode in contact with nitric acid.
Explosive reaction with Nitric Acid + Nitrobenzene + water.
Detonation with Nitric Acid + 4-Methylcyclohexane.
The addition of warm fuming nitric acid to phosphine causes explosion.
Addition of water to nitration mixture diluted with an equal volume of water can cause a low order explosion.
Cyclopentadiene reacts explosively with fuming nitric acid.
Mixtures of fuming nitric acid and acetonitrile are high explosives.
(Nitric acid, fuming)

Section 6: Accidental Release Measures

Small Spill:
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: Neutralize the residue with a dilute solution of sodium carbonate.

Large Spill:
Corrosive liquid. Oxidizing material. Poisonous liquid.
Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Avoid contact with a combustible material (wood, paper, oil, clothing...). Keep substance damp using water spray. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Neutralize the residue with a dilute solution of sodium carbonate. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:
Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Keep away from combustible material.. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as reducing agents, combustible materials, organic materials, metals, acids, alkalis, moisture. May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package.

Storage:
Keep container tightly closed. Keep container in a cool, well-ventilated area. Separate from acids, alkalies, reducing agents and combustibles. See NFPA 43A, Code for the Storage of Liquid and Solid Oxidizers. Do not store above 23°C (73.4°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their

respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Face shield. Full suit. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves. Boots.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:
TWA: 2 STEL: 4 (ppm) from ACGIH (TLV) [United States]
TWA: 2 STEL: 4 from OSHA (PEL) [United States]
Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Liquid.

Odor: Acrid. Disagreeable and choking. (Strong.)

Taste: Not available.

Molecular Weight: Not applicable.

Color: Colorless to light yellow.

pH (1% soln/water): Acidic.

Boiling Point: 121°C (249.8°F)

Melting Point: -41.6°C (-42.9°F)

Critical Temperature: Not available.

Specific Gravity: 1.408 (Water = 1)

Vapor Pressure: 6 kPa (@ 20°C)

Vapor Density: 2.5 (Air = 1)

Volatility: Not available.

Odor Threshold: 0.29 ppm

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: See solubility in water, diethyl ether.

Solubility:
Easily soluble in cold water, hot water.
Soluble in diethyl ether.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances:
Highly reactive with alkalis.
Reactive with reducing agents, combustible materials, organic materials, metals, acids.

Corrosivity:
Extremely corrosive in presence of aluminum, of copper, of brass.
Non-corrosive in presence of glass, of stainless steel(304), of stainless steel(316)

Special Remarks on Reactivity:
A strong oxidizer.
Reacts violently with alcohol, organic material, turpene, charcoal.
Violent reaction with Nitric acid + Acetone and Sulfuric acid.
Incompatible with combustible materials, metallic powders, hydrogen sulfide, carbides, aldehydes, cyanides, chromic acid, hydrogen sulfide, metals, metal powders, organic solvents, acetic acid, alcohols.
Nitric Acid will react with water or steam to produce heat and toxic, corrosive and flammable vapors.
(Nitric acid, fuming)

Special Remarks on Corrosivity:
In presence of traces of oxides, it attacks all base metals except aluminum and special chromium steels.
It will attack some forms of plastics, rubber, and coatings.
Nitric Acid corrodes almost all metals except gold, and white gold, forming nitrates.
No corrosive effect on bronze.
No corrosivity data for zinc, and steel

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
LD50: Not available.
LC50: Not available.

Chronic Effects on Humans:
Contains material which may cause damage to the following organs: lungs, mucous membranes, upper respiratory tract, skin, eyes, teeth.

Other Toxic Effects on Humans:
Extremely hazardous in case of inhalation (lung corrosive).
Very hazardous in case of skin contact (corrosive, irritant, permeator), of eye contact (corrosive), of ingestion, .

Special Remarks on Toxicity to Animals: LDL - Lowest Published Lethal Dose [Human] - Route: Oral; Dose: 430 mg/kg (Nitric acid, fuming)

Special Remarks on Chronic Effects on Humans: May cause adverse reproductive effects based on animal data (effects on newfborn, fetotoxicity)

Special Remarks on other Toxic Effects on Humans:
Acute Potential Health Effects:
Skin: Severely irritates skin. Causes skin burns and may cause deep and penetrating ulcers of the skin with a characteristic yellow to brownish discoloration. May be fatal if absorbed through skin.
Eyes: Severely irritates eyes. Causes eye burns. May cause irreversible eye injury.
Ingestion: May be fatal if swallowed. Causes serious gastrointestinal tract irritation or burns with nausea, vomiting, severe abdominal pain, and possible "coffee grounds" appearance of the vomitus . May cause perforation of the digestive tract.

Inhalation: May be fatal if inhaled. Vapor is extremely hazardous. Vapor may cause nitrous gas poisoning. Effects may be delayed. May cause irritation of the mucous membranes and respiratory tract with burning pain in the nose and throat, coughing, sneezing, wheezing, shortness of breath and pulmonary edema. Other symptoms may include nausea, and vomiting.
Chronic Potential Health Effects:
Repeated inhalation may produce changes in pulmonary function and/or chronic bronchitis. It may also affect behavior (headache, dizziness, drowsiness, muscle contaction or spasticity, weakness, loss of coordinaton, mental confusion), and urinary system (kidney faillure, decreased urinary output after several hours of uncorrected circulatory collapse).
Repeated exposure may cause discoloration and/or errosion of teeth (dental enamel).
Eye irritation and respiratory tract signs and symptoms resembling those of frequent upper respiratory viral infections have been associated with chronic nitric acid exposure.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Nitric acid (Nitric acid, fuming) UNNA: 2031 PG: II

Special Provisions for Transport: Marine Pollutant

Section 15: Other Regulatory Information

Federal and State Regulations:
New York release reporting list: Nitric acid, fuming
Rhode Island RTK hazardous substances: Nitric acid, fuming
Pennsylvania RTK: Nitric acid, fuming
Florida: Nitric acid, fuming
Minnesota: Nitric acid, fuming
Massachusetts RTK: Nitric acid, fuming
New Jersey: Nitric acid, fuming
TSCA 8(b) inventory: Water; Nitric acid, fuming
SARA 302/304/311/312 extremely hazardous substances: Nitric acid, fuming
SARA 313 toxic chemical notification and release reporting: Nitric acid, fuming 70%
CERCLA: Hazardous substances.: Nitric acid, fuming: 1000 lbs. (453.6 kg);

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada):
CLASS D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

DSCL (EEC):
R8- Contact with combustible material
may cause fire.
R35- Causes severe burns.
S23- Do not breathe gas/fumes/vapour/spray
[***]
S26- In case of contact with eyes, rinse
immediately with plenty of water and seek
medical advice.
S36- Wear suitable protective clothing.
S45- In case of accident or if you feel unwell,
seek medical advice immediately (show the
label where possible).

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 0

Personal Protection:

National Fire Protection Association (U.S.A.):

Health: 4

Flammability: 0

Reactivity: 0

Specific hazard:

Protective Equipment:
Gloves.
Full suit.
Vapor respirator. Be sure to use an
approved/certified respirator or
equivalent. Wear appropriate respirator
when ventilation is inadequate.
Face shield.

Section 16: Other Information

References: Not available.

Other Special Considerations: Not available.

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